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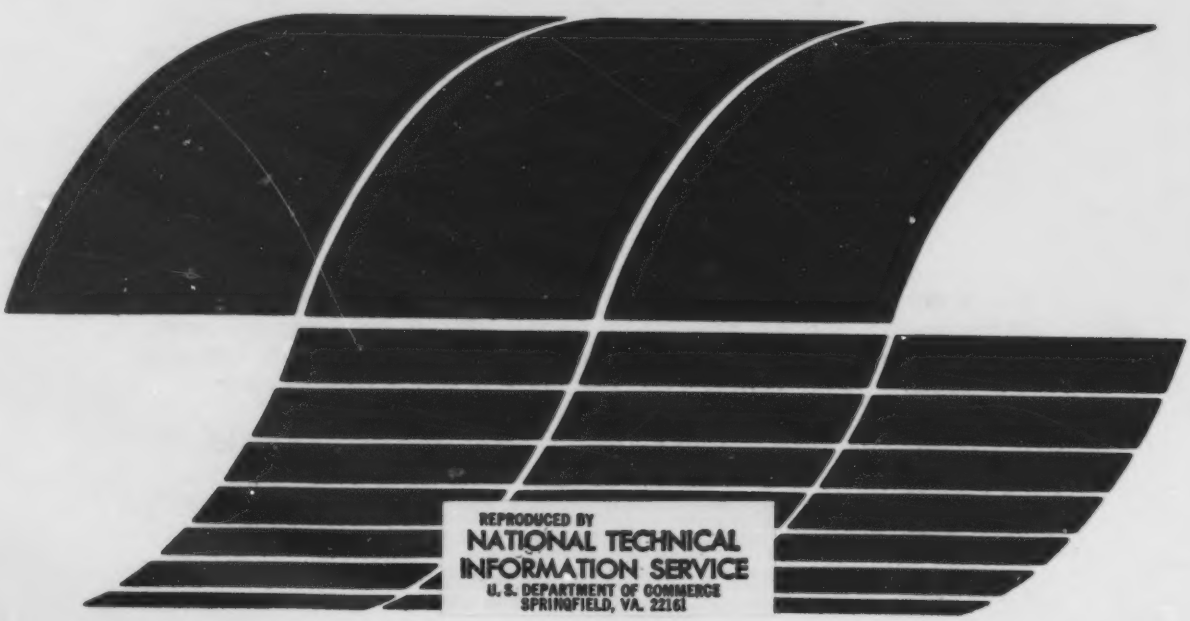

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16. ABSTRACT

The report gives results of fractional and overall mass efficiency tests of two Apitron electrostatically augmented fabric filter dust collectors. The tests were performed on a mobile pilot-scale system collecting flyash produced by a pulverized-coal-fired industrial boiler and on a full-scale pilot plant collecting redispersed silica dust. Total particulate concentrations were determined at the inlet and outlet of both devices. Inlet and outlet emission rates, as a function of particle size, were determined from about 0.5 to 8 micrometers on a mass basis using cascade impactors, and from about 0.01 to 1.0 micrometers using electrical mobility and optical techniques. Total mass efficiency for the mobile system was 99.90-99.94%; fractional efficiencies for the 0.2-1 micrometer particle size range were 99.85-99.94%. Total mass efficiency for the full-scale pilot system was 99.995-99.9994%; fractional efficiencies in the 0.2-1 micrometer size range were 99.90-99.999%.

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EVALUATION OF AN APITRON ELECTROSTATICALLY AUGMENTED FABRIC FILTER

ABSTRACT

This report presents the results of fractional and overall mass efficiency tests of two Apitron electrostatically augmented fabric filter dust collectors. The tests were performed on a mobile pilot scale system collecting fly ash produced by a pulverized coal-fired industrial boiler and on a full scale pilot plant facility collecting redispersed silica dust.

The first series of tests was conducted in December, 1977 on the mobile device and the second series of tests were conducted in June, 1978 on the full scale pilot plant facility located at the manufacturer's facilities in Buffalo, New York.

Total particulate concentrations were determined at the inlet and outlet of both devices. Inlet and outlet emission rates as a function of particle size were determined from about 0.5 μm to 8 μm on a mass basis using cascade impactors and from about 0.01 μm to 1.0 μm using electrical mobility and optical techniques.

SECTION 1

CONCLUSIONS

This evaluation was one of a series of studies being conducted by the Industrial Environmental Research Laboratory of the Environmental Protection Agency to identify and test novel devices which are capable of high efficiency collection of fine particulates. The test methods used may not have been consistent with compliance-type methods, but were state-of-the-art techniques for measuring mass and fractional efficiency and included standard filtration methods as well as inertial, optical, and electrical mobility techniques.

The first novel control device tested was a small-scale, mobile, electrostatically augmented fabric filter system (APITRON). The collection efficiency, as determined by conventional filter techniques, when the system was collecting fly ash from a pulverized coal-fired boiler, ranged from 99.90% to 99.94%. The system pressure drop when operating in a normal mode at a face velocity of 33 to 35 mm/sec (6.5-6.9 fpm) was approximately 3.0 cm to 3.8 cm w.c. (1.2-1.5 in. w.c.). Fractional efficiencies in the size range from about 0.2 μm to 1 μm were approximately 99.85% to 99.94%. The system energy usage during this first series of tests was 2500 Joules/SCM.

Because of instrument difficulties with the electrical mobility technique and indications of insufficient conditioning of the bags used in the mobile unit testing, a second series of tests was performed. This second test series was performed on a full-scale pilot plant facility maintained by the manufacturer, American Precision Industries. During this second series of tests, the collection efficiency of the system, when collecting redispersed

silica dust at ambient temperatures, ranged from 99.995% to 99.9994%. The system pressure drop when operating in a normal mode at a face velocity of 29.4 mm/sec (5.8 fpm) was approximately 9.4 cm w.c. (3.7 in. w.c.). Fractional efficiencies in the size range from about 0.2 μm to 1.0 μm were approximately 99.90% to 99.999%. The system energy usage during this series of tests ranged from 1370 Joules/SCM at one-quarter ionizing power in the ESP section to 3390 Joules/SCM at full ionizing power. Power off operation required reduced face velocities and energy requirements to the range of 1500-2300 Joules/SCM.

SECTION 2

INTRODUCTION

This report presents results of tests conducted by Southern Research Institute (SoRI) to determine the fine particle collection capabilities of the Apitron electrostatically augmented fabric filter. The goals of the tests were to determine the overall mass efficiency and the fractional efficiency of the system when operating under normal design conditions. Two Apitron systems were tested during the program. The first system was a mobile pilot plant designed to process up to about 7 m^3/min (250 acfm) at face velocities up to about 75 mm/sec (15 fpm). This unit was tested on a slip-stream from a pulverized coal boiler.

Further tests were conducted on a full scale pilot plant facility maintained by the manufacturer, American Precision Industries, which was designed to operate at flow rates of about 283 m^3/min (10,000 acfm). The system in this case collected redispersed silica dust at ambient temperatures.

Figure 1 is a schematic of the system layout for the first series of tests. The control device, together with its power supply, is mounted in the central section of a standard 40 foot semi-trailer. The rear section of the trailer houses a compressed air supply for bag and tube cleaning and a blower which provides the required system draft. The forward section of the trailer houses an office and control center.

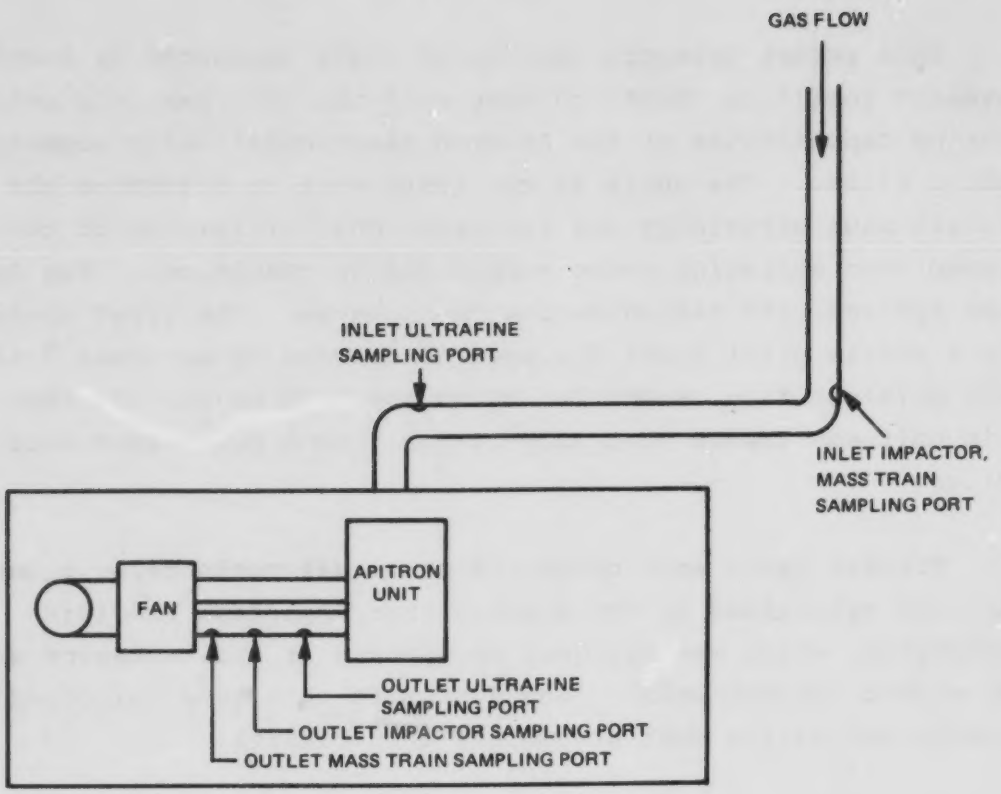

Figure 1. Layout of sampling locations for tests of the Apitron mobile pilot plant.

The geometry of the test site was such that a long run of ducting was required to convey the flue gases from the boiler ducting to the trailer mounted filter unit. This ducting was insulated but infiltration of ambient air at joints resulted in a large temperature drop and substantial dilution of flue gases between the sample take off point and the trailer. Additional cooling of the flue gases took place in the Apitron device proper, in which a trial heat recovery system was being evaluated by Apitron at the time of these tests. Outlet gas temperatures were generally about 95°C (160°F). The flue gas temperature at the sample take off point was approximately 205°C (400°F). This dropped to about 110°C (230°F) at the actual inlet of the device.

Two bag materials, Nomex and Teflon, were used during the tests of the mobile unit. Air flows as measured in the outlet ducting were about 7 am^3/min (250 acfm). Typical filter pressure drops were about 3 cm w.c. at these flow rates with electrostatic augmentation, and 9 cm w.c. without electrostatics. The specific collection area of the electrostatic portion of the system was about 8.6 $m^2/(am^3/s)$ (43 ft^2/1000 acfm). Operating voltages were about 30 kv and current densities were about 535 nA/cm^2 (500 $\mu A/ft^2$).

The tests of the mobile unit took place during the period between November 29, 1977 and December 9, 1977.

The second series were conducted on a full scale facility as illustrated in Figure 2. Redispersed silica dust is drawn into the inlet air duct and enters the device at the lower right hand side. After passing through the wire-pipe precipitator tubes and bag filters it is drawn out through an exit on the far side of the device. The inlet ducting is 45.7 cm (18 inches) O.D. and the outlet ducting is 122 cm (48 inches) O.D. The device

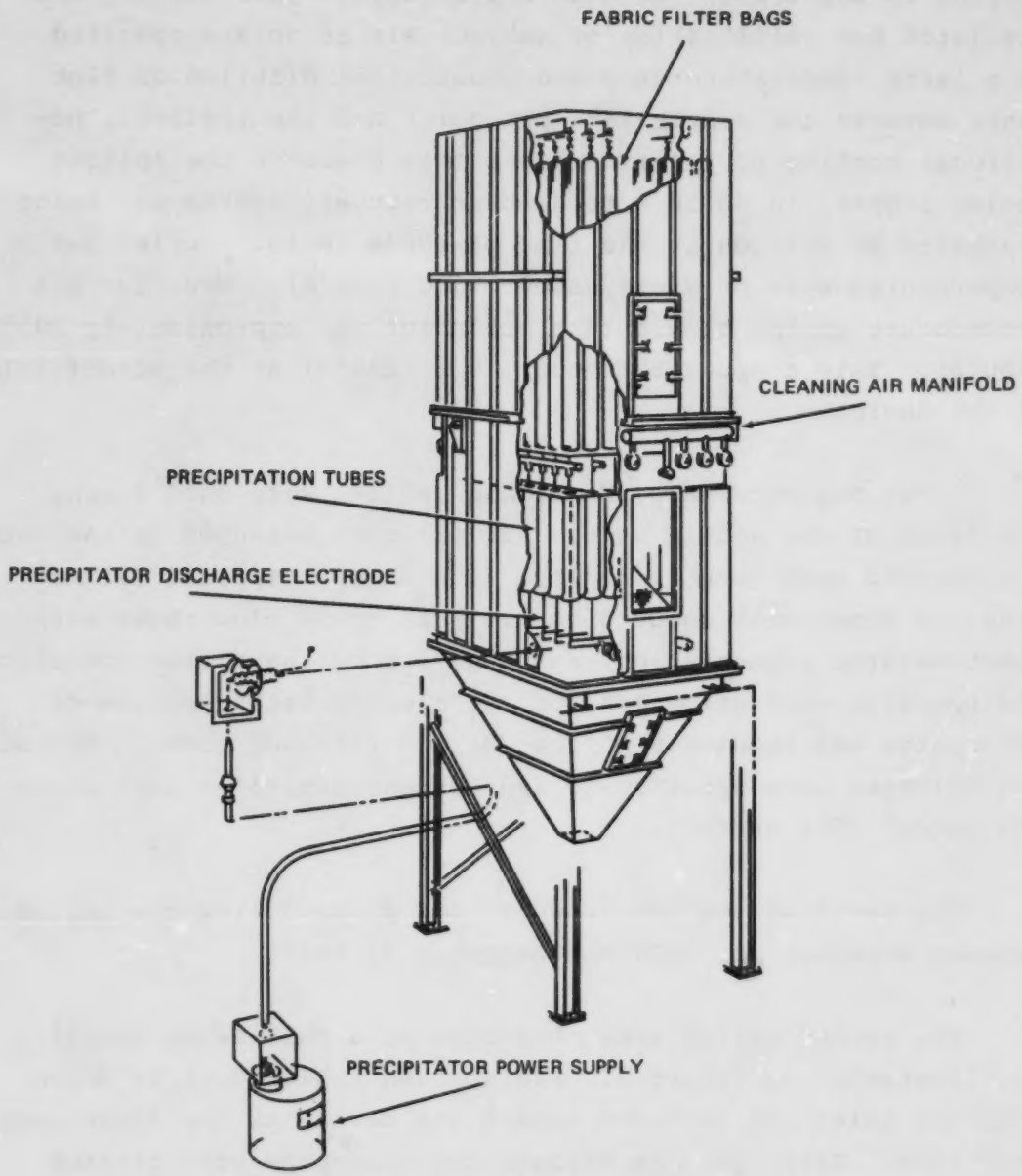

Figure 2. Layout of a full scale Apitron unit.

operates using ambient air at ambient pressure and temperature conditions. During this series of tests, the ambient temperatures averaged around 22°C (72°F). The bags were constructed of felted polyester material. Typical system pressure drops were about 9.1 cm w.c. (3.6 in. w.c.) at a flow rate of 283 am^3/min (10,000 acfm) with electrostatic augmentation to as much as 25 cm w.c. (10 in. w.c.) at a flow rate of 232 am^3/min (8200 acfm) without electrostatics. Operating voltages ranged from 27 kV to 39 kV with current densities varying from 281 nA/cm^2 (261 $\mu A/ft^2$) to 773 nA/cm^2 (718 $\mu A/ft^2$).

The second series of tests took place during the period between June 12, 1978 and June 19, 1978.

SECTION 3

DISCUSSION

A total of four measurement techniques were used during the tests. These were: (1) electrical mobility techniques for determining the concentration and size distribution on a number basis for particles having diameters from about 0.01 μm to about 0.3 μm, (2) optical techniques to determine concentration and size distributions for particles with diameters between about 0.3 μm and 2.0 μm, (3) inertial techniques using cascade impactors for determining concentrations and size distributions on a mass basis over the size range from 0.3 μm and 6.0 μm, and (4) standard filtration techniques for determining total inlet and outlet mass loadings.

DESCRIPTION OF THE APITRON FILTER SYSTEM

Figure 3 provides a cutaway view of the first pilot plant tested. The device is divided into two separate compartments, which share a common inlet, hopper, and power supply but each has its own exit duct and flow metering capability. Only one of the two compartments was used in these tests. Pertinent dimensions and operating data for this and the full scale unit are given in Table 1.

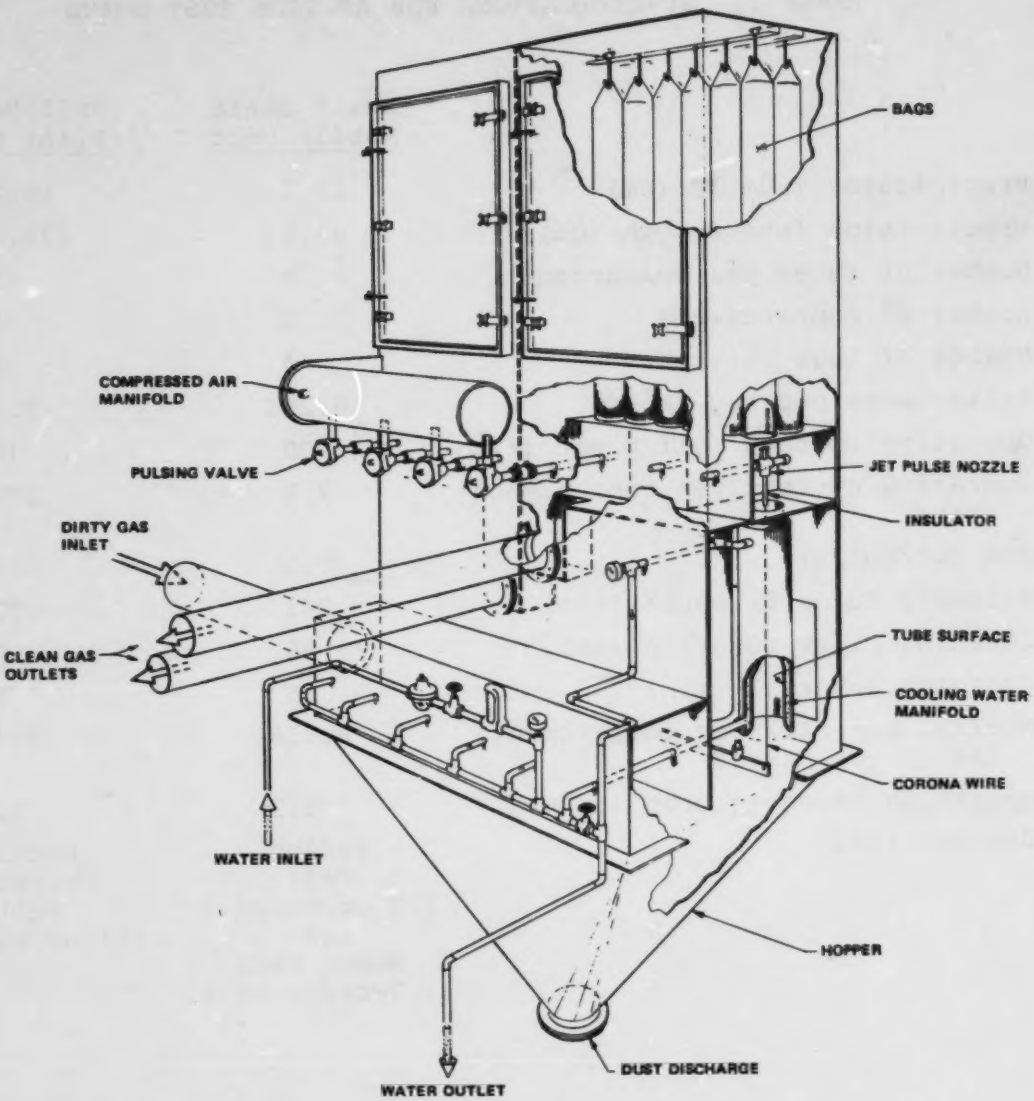

Figure 3. Cutaway view of a trailer mounted, mobile, pilot plant Apitron unit.

TABLE 1. SPECIFICATIONS FOR APITRON TEST UNITS

	Small Scale Mobile Unit	Full Scale Pilot Plant
Precipitator Tube ID (cm)	12.7	15.2
Precipitator Tube Length (cm)	83.8	121.9
Number of tubes per compartment	3	72
Number of compartments	2	1
Number of bags per tube	4	1
Filter area per bag (m^2)	0.293	2.23
Operating voltage full power (kV)	30	39
Operating current per compartment (mA)	7.5	325
SCA ($m^2/am^3/s$)	8.5	8.9
Cleaning Pulse Pressure (kPa)	241	552
Cleaning Pulse Duration (ms)	50	50
Cleaning Interval (min)	6	8
Nominal air flow per compartment (Am^3/s) as tested	0.118	4.72
Operating Pressure Drop (cm w.g.)	3.3	7.1
Bag Material	Teflon Felt (23 oz/sq.yd.) and Nomex Felt (12 oz/sq.yd.)	Dacron Polyester Felt (11 oz/sq.yd.)

Incoming air enters the precipitator section from below with the upper portion of the hopper serving as an inlet plenum as illustrated in Figure 4. The flow then passes upward, through the tubes of a set of parallel wire-pipe precipitators in which the particulate is charged and much is precipitated. Flow continues upward, past the tubes, into and through the bags where the final filtration takes place. Clean air exits the unit at an exhaust located in the side of the bag housing section. In the mobile unit each tube (and associated set of bags) is cleaned one at a time with a six minute interval between successive cleanings of any one tube and bag set. In the full scale system, six bag and tube sets are cleaned at a time. Cleaning is initiated by an electrical pulse from the control system which opens a diaphragm valve for several tens of milliseconds. A blow pipe connected to the valve is then pressurized which results in a compressed air jet downward from a nozzle directly above and concentric with the corona wire of the tube being cleaned. The jet of air flowing downward through the tube entrains and mixes with a secondary air flow sweeping the tube clean of deposited dust by the mixture of high velocity air. The secondary air flow, passing from the outside to the inside of the bags, snaps the bags inward and dislodges the dust deposits from the bags. (A 708 am^3/min (25,000 acfm) unit would require about 0.85 m^3/min (30 scfm) of compressed air at 80 psig.) Vertical height constraints in the mobile pilot plant required the use of four short bags in parallel over each precipitator tube rather than one longer bag over each tube as is used in full scale systems. The system operation is illustrated in Figure 5.

In the first series of tests, the first two days of testing was done with relatively old Nomex bags in use. These bags had been subjected to sulfuric acid attack during an earlier test program and were tested only because a new set of Teflon bags

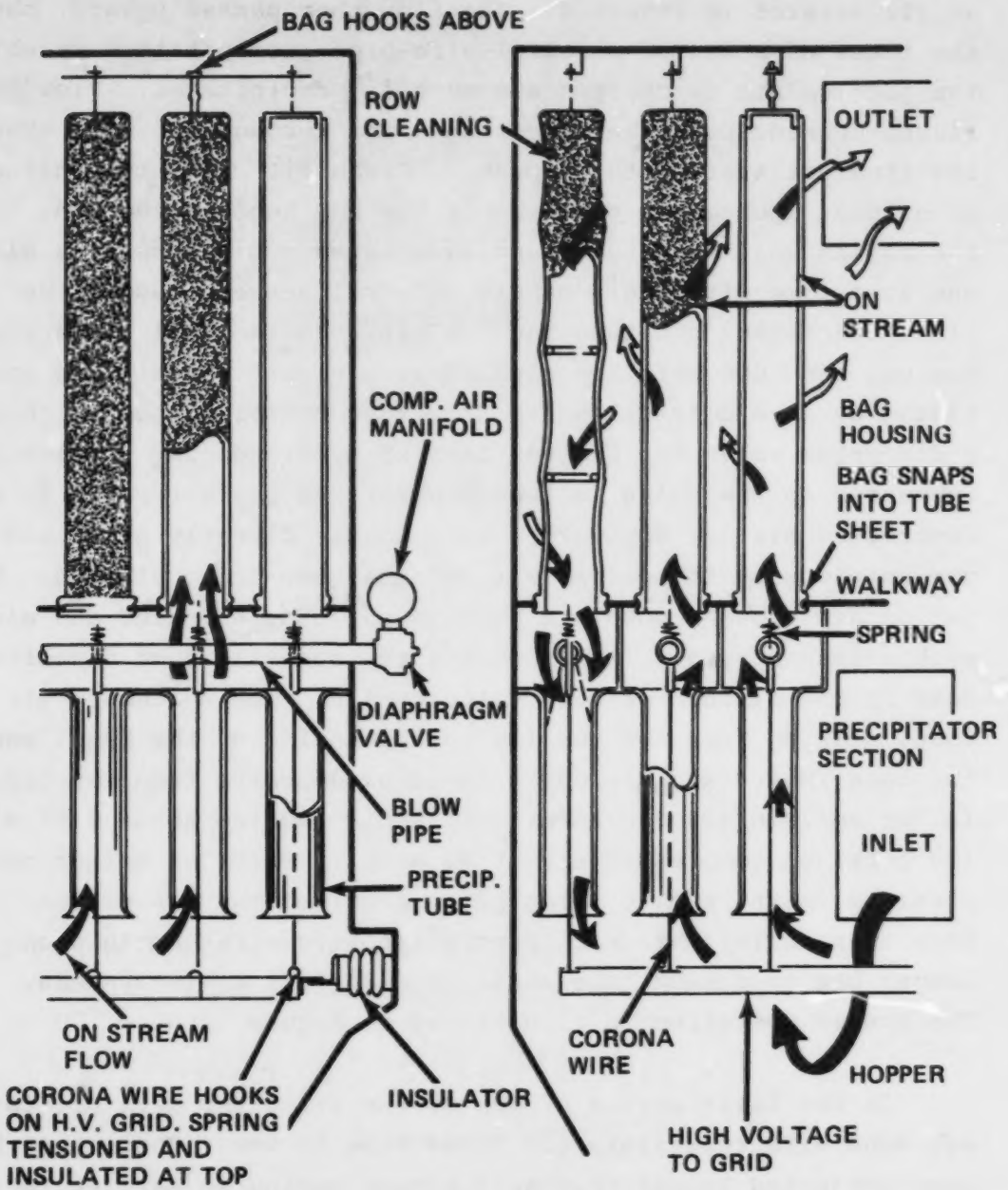

Figure 4. Principle of operation of the Apitron dust collector.

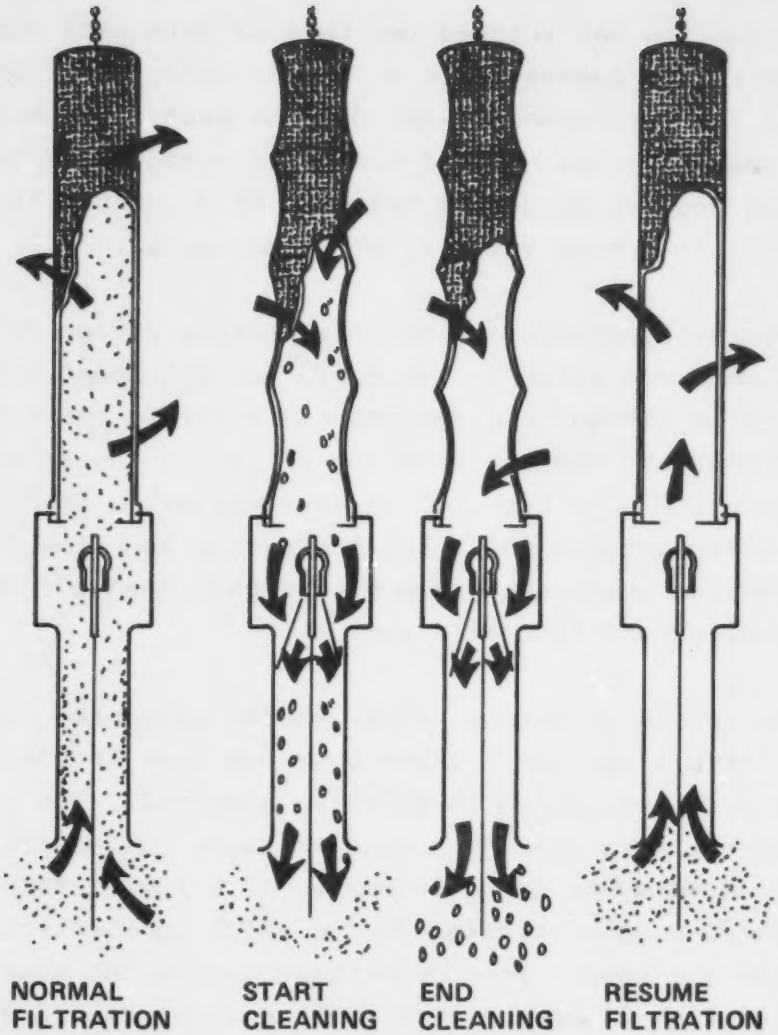

Figure 5. Apitron dust collector operating cycle.

which were scheduled to be used were not immediately available. After two days of testing with the Nomex bags the Teflon bags arrived and were installed. One day of tests were performed with the new, unconditioned Teflon material, after which the bags were run continuously for two more days over a weekend for conditioning before testing was resumed.

After testing was resumed two days of data were obtained with electrostatic augmentation at a face velocity of about 35 mm/sec (6.9 fpm), followed by two days of testing without electrostatic augmentation. One of the tests without electrostatic augmentation was run at a face velocity of 33 mm/sec (6.5 fpm) and the other at a face velocity of 14 mm/sec (2.7 fpm).

The operating conditions for the Apitron device during the seven test days are given in Table 2a. As mentioned earlier, infiltration of ambient air resulted in a marked temperature drop throughout the ducting from the boiler to the Apitron trailer. This infiltration also resulted in non-negligible dilution of the stack gases between the inlet and outlet sampling locations. All efficiencies which are given herein have been corrected to remove the effect of this dilution.

In the second series of tests, Dacron polyester felt bags were used for all testing. These bags had been in use for several months and were considered to be fully seasoned. The first two days of testing were done at a quarter power ESP condition with a bag face velocity of about 30 mm/sec (5.8 fpm). This was followed by three days of testing during which no electrostatic augmentation was used. Face velocities during the nonaugmented tests varied from 24 mm/sec (4.8 fpm) to 27 mm/sec (5.3 fpm). During the two final days of testing, the effect of electrostatic augmentation at various power levels was investigated. During this period the face velocity was kept constant at 29.4 mm/sec (5.79 fpm).

TABLE 2a. APITRON MOBILE UNIT TEST CONDITIONS

Date	Bag Material	Outlet gas flow		Outlet temp.	Bag Face	Velocity	ESP conditions						Apitron pressure drop	Energy usage, air moving
							Voltage	Current	Specific collecting area		Current density	Energy usage		
		am^3/min	acfm	°C	mm/sec	fpm	kv	mA	$m^2/am^3/s$	$ft^2/1000$ acfm	nA/cm^2	$joules/m^3$	cm w.c.	$joules/m^3$
11/30/77	Nomex	7.31	258	74	34.7	6.83	31	7.5	8.25	41.9	750	1910	5.3	530
12/1/77	Nomex	7.00	247	77	33.2	6.53	31	7.5	8.60	43.7	750	2000	5.3	520
12/2/77	Teflon[a]	8.47	299	71	40.2	7.91	30.5	7.5	7.11	36.1	750	1620	0.5	50
12/5/77	Teflon	7.42	262	74	35.2	6.93	30	8.0	8.11	41.2	800	1940	3.0	300
12/6/77	Teflon	7.00	247	74	33.2	6.53	29	8.5	8.60	43.7	850	2120	3.8	380
12/7/77	Teflon	6.91	244	74	32.8	6.46	0	0	0	0	0	0	8.9	868
12/8/77	Teflon	2.92	103	54	13.8	2.72	0	0	0	0	0	0	3.3	323

TABLE 2b. APITRON FULL SCALE PILOT PLANT TEST CONDITIONS

Date	Bag Material	Outlet gas flow		Outlet temp.	Bag Face	Velocity	ESP conditions						Apitron pressure drop	Energy usage, air moving
							Voltage	Current	Specific collecting area		Current density	Energy usage		
		am^3/min	acfm	°C	mm/sec	fpm	kv	mA	$m^2/am^3/s$	$ft^2/1000$ acfm	nA/cm^2	$joules/m^3$	cm w.c.	$joules/m^3$
6/12-6/14	Dacron	283	10,000	20	29.4	5.79	27	118	8.91	45.2	281	675	7.1	720
6/14-6/15	Dacron	243	8,600	24	25.3	4.98	0	0	0	0	0	0	21.6	2200
6/15-6/16	Dacron	261	9,200	22	27.0	5.32	0	0	0	0	0	0	22.9	2330
6/16-6/17	Dacron	232	8,200	24	24.1	4.75	0	0	0	0	0	0	14.6	1490
6/17-6/18	Dacron	283	10,000	24	29.4	5.79	27-33	118-190	8.91	45.2	281-432	675-1330	7.1	720
6/18-6/19	Dacron	283	10,000	24	29.4	5.79	39	325	8.91	45.2	773	2690	7.1	720

[a]New, clean Teflon bags installed overnight of 12/1 - 12/2

The operating conditions of the full scale collector are given in Table 2b for the tests conducted during June 1978.

TOTAL PARTICULATE COLLECTION RESULTS

The results of the total particulate tests of the mobile unit are given in Table 3. The measured inlet and outlet concentrations are given together with the appropriate dilution corrections, the corrected total particulate collection efficiency, and the total power usage of the control device. The power consumption figures do not include the required compressor power for the cleaning pulses nor any conversion efficiencies for fans, motors, power supplies, etc. The estimated total energy usage including losses in the latter items is approximately 40% greater than the figures given in the table.

Table 4 shows conditions and results of the tests of the full scale unit. As with the earlier data on energy usage, the required compressor power for the cleaning pulses and the conversion efficiencies for fans, motors, power supplies, etc. are not included.

CASCADE IMPACTOR RESULTS

Inertial sizing of the inlet and outlet particulates was accomplished using modified Brink impactors and University of Washington Mark III impactors.

For the mobile unit tests, sampling was done at isokinetic rates using heated enclosures to contain the impactors and short stainless steel probes for conveying the samples from the ducts to the impactors. In situ operation of the impactors was not possible because of the small duct dimensions - 20 cm (8 in.) at the inlet and 15 cm (6 in.) at the outlet. Modified Brink

TABLE 3. PERFORMANCE TESTS RESULTS FOR THE MOBILE APITRON PILOT PLANT

Date	Inlet loading, mg/DNm³	Outlet loading, mg/DNm³	Dilution correction factor	Collection efficiency, %	Total energy usage	
					joules/am³	hp/1000 acfm
12/1/77	4600	10.6	1.79	99.59	2520	1.60
12/2/77	3940	4.26	1.46	99.84	1670	1.06
	4580	5.54				
12/5/77	5580	3.43	1.60	99.902	2240	1.42
12/6/77	4960	2.09	1.50	99.940	2500	1.58
	6150	2.33				
12/7/77	2170	0.99	1.63	99.905	868	0.55
	2060	1.50				
	2150					
12/8/77	3230	1.20	1.89	99.928	323	0.20
	2950	1.14				

TABLE 4. PERFORMANCE TEST RESULTS FOR THE FULL SCALE APITRON UNIT

Date	Inlet loading, mg/DNm^3	Outlet loading, mg/DNm^3	Collection efficiency, %	Total energy usage	
				joules/am^3	hp/1000 acfm
6/12 - 6/14	12800	0.172	99.9987	1370	0.87
6/14 - 6/15	12600	0.480	99.9962	2120	1.35
6/15 - 6/16	12800	0.366	99.9971	2250	1.43
6/16 - 6/17	12400	0.126	99.9990	1440	0.91
6/17 - 6/18	12800	0.119	99.99907	1750-2400	1.11-1.52
6/18 - 6/19	12800	0.094	99.99927	3580	2.27

impactors were used for all inlet sampling and University of Washington impactors were used for outlet sampling. Both types were used with Apeizon H grease coatings on stainless steel shim stock impaction substrates.

The average inlet size distribution for the mobile unit tests is given in Figure 6 on a cumulative percent by weight basis and in Figure 7 on a cumulative mass loading (concentration) basis.

Fractional efficiencies are shown on an aerodynamic diameter basis, by day, in Figures 8 through 11. Collection efficiencies in excess of 99% were consistently obtained in the fine particle size range ($\leq$3μm) when either the Teflon or Nomex bags were used. The efficiency curves for both materials showed efficiency minima near a diameter of 7 μm which may have resulted from primary or agglomerated particles bleeding through the fabric of the bags. The efficiencies were higher on the two days of testing with the ESP section de-energized than during the tests with power on. The highest efficiencies during the entire test series were obtained on Dec. 8 when the device was operated as a conventional baghouse at a low face velocity. There is some uncertainty in the significance of the differences among the results for the various test conditions with the Teflon bags because the bags were being tested immediately after installation and for a few days thereafter. The efficiency of the device showed a constant improvement with each day of testing after the new bags were installed. Thus, the efficiencies which were obtained during the last two days of testing with the ESP de-energized may have been equaled or exceeded had it been energized. Previous testing by the manufacturer had shown higher efficiencies with electrostatic augmentation than without for tests at fixed face velocities.

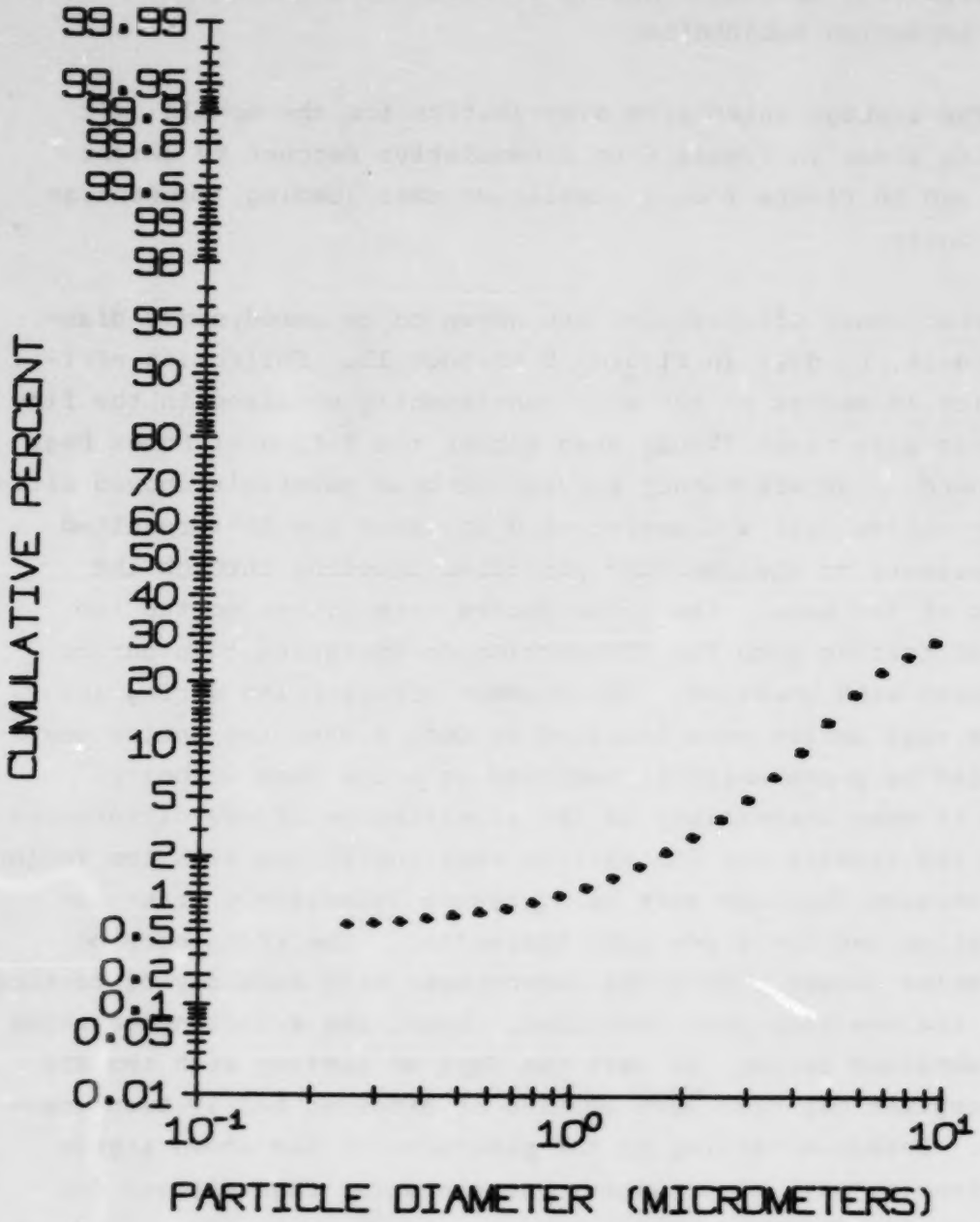

Figure 6. Average inlet size distribution for the Apitron mobile unit tests. Cumulative percent (by weight basis) vs. aerodynamic particle diameter in micrometers.

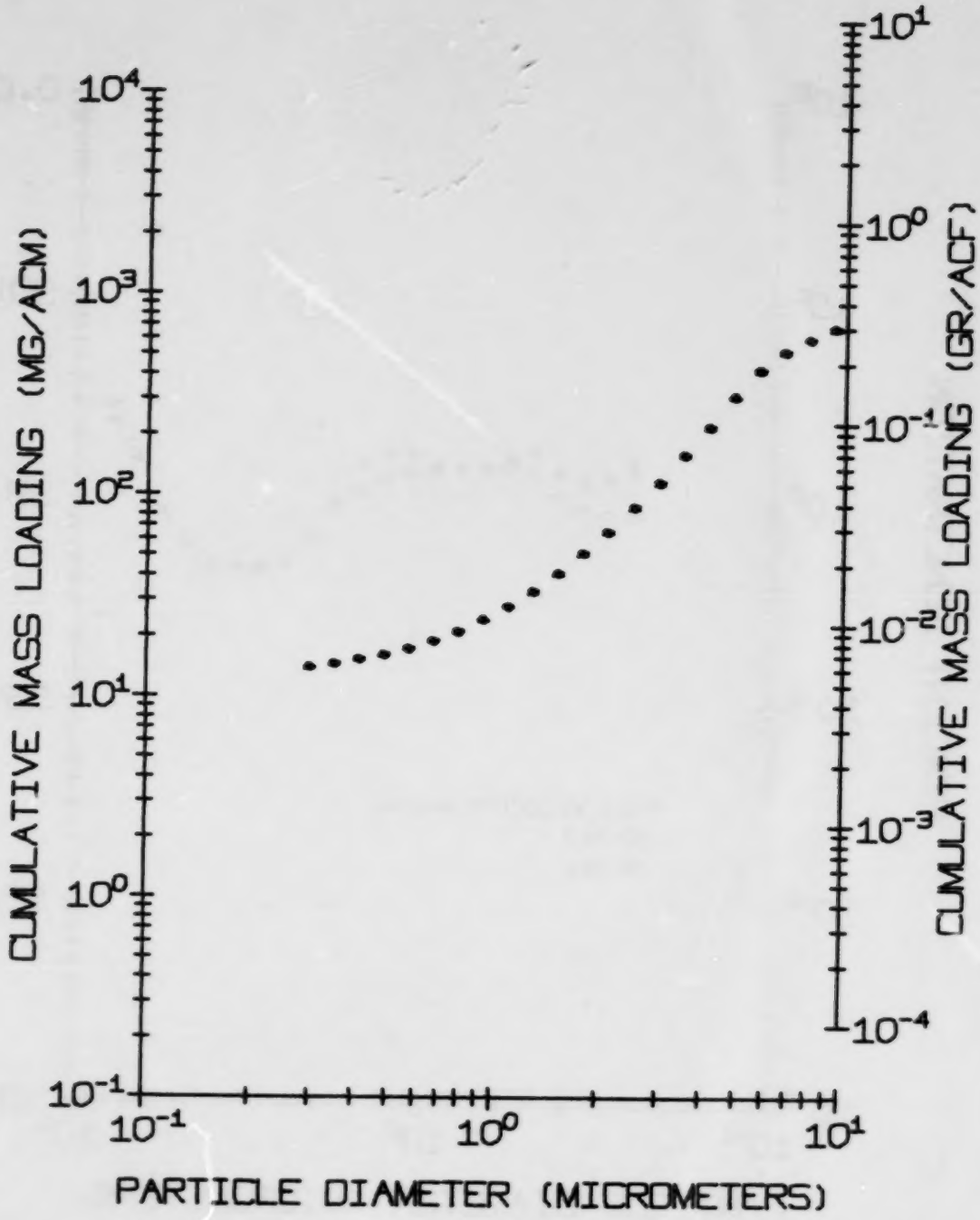

Figure 7. Average inlet size distribution for the Apitron mobile unit tests. Cumulative mass loading in mg/ACM vs. aerodynamic particle diameter in micrometers.

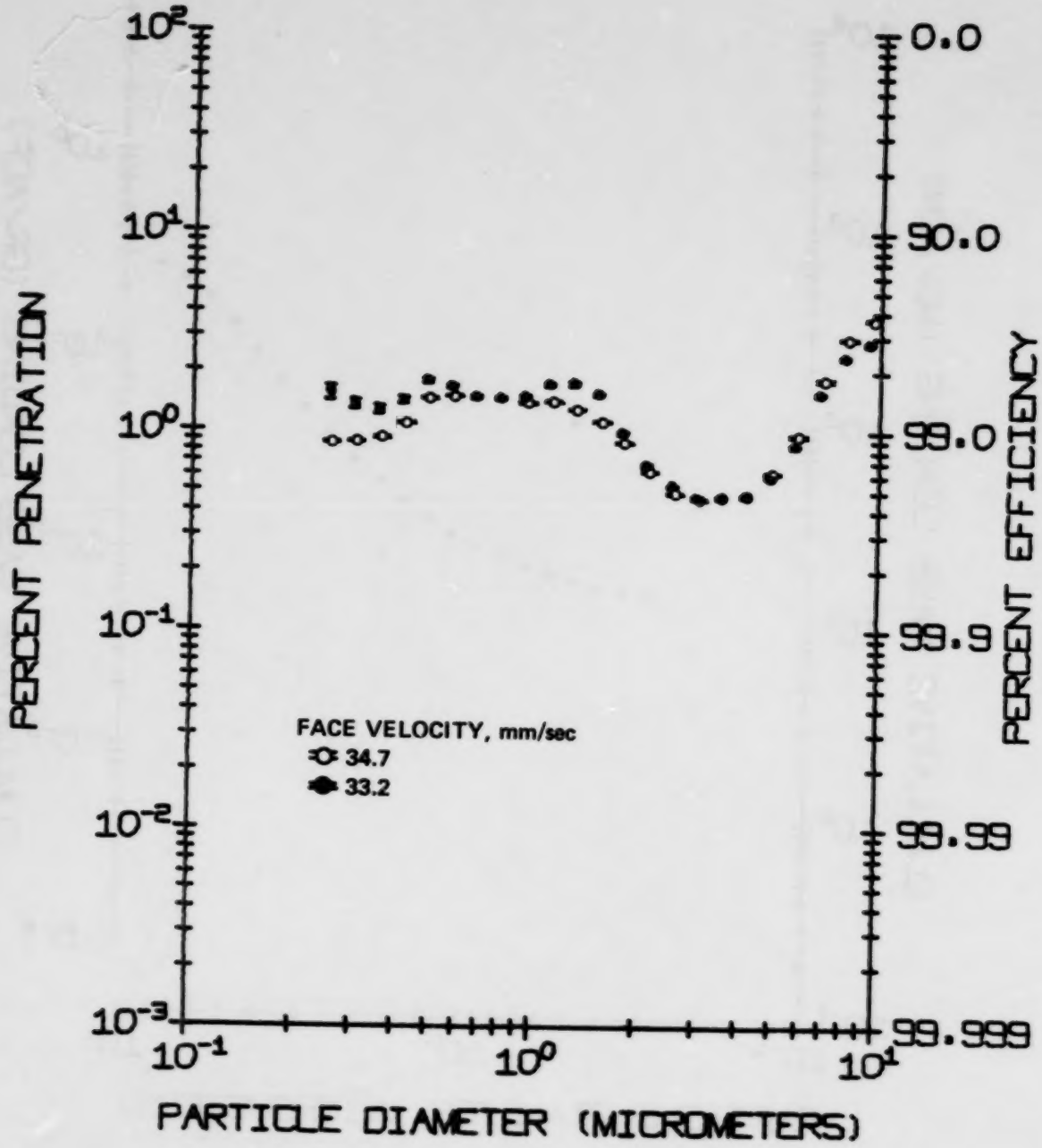

Figure 8. Apitron fractional efficiency with aged Nomex bags, 11/30/77–12/1/77, vs. aerodynamic particle diameter in micrometers.

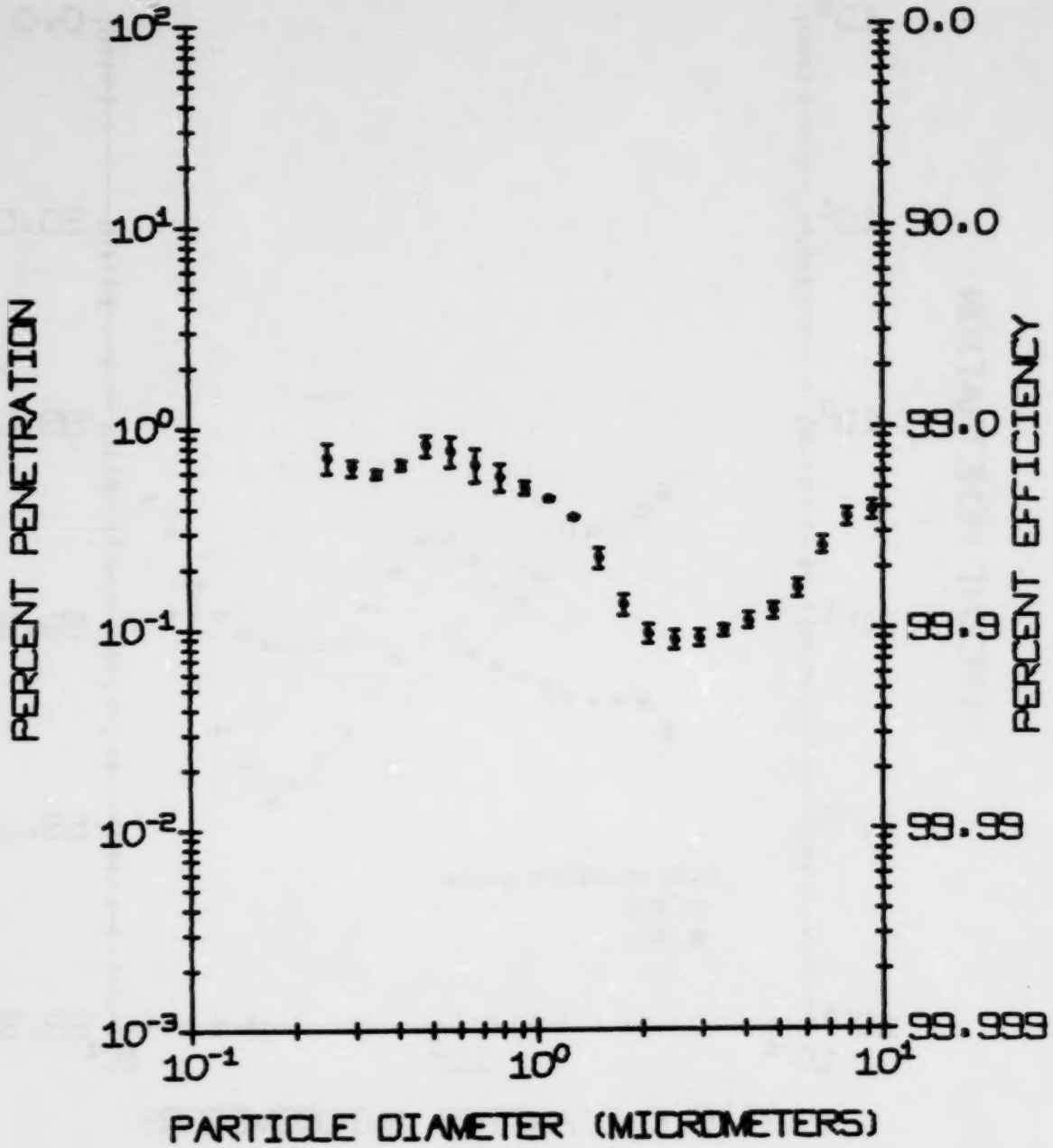

Figure 9. Apitron fractional efficiency with new Teflon bags, impactor measurements, 12/2/77, vs. aerodynamic particle diameter in micrometers.

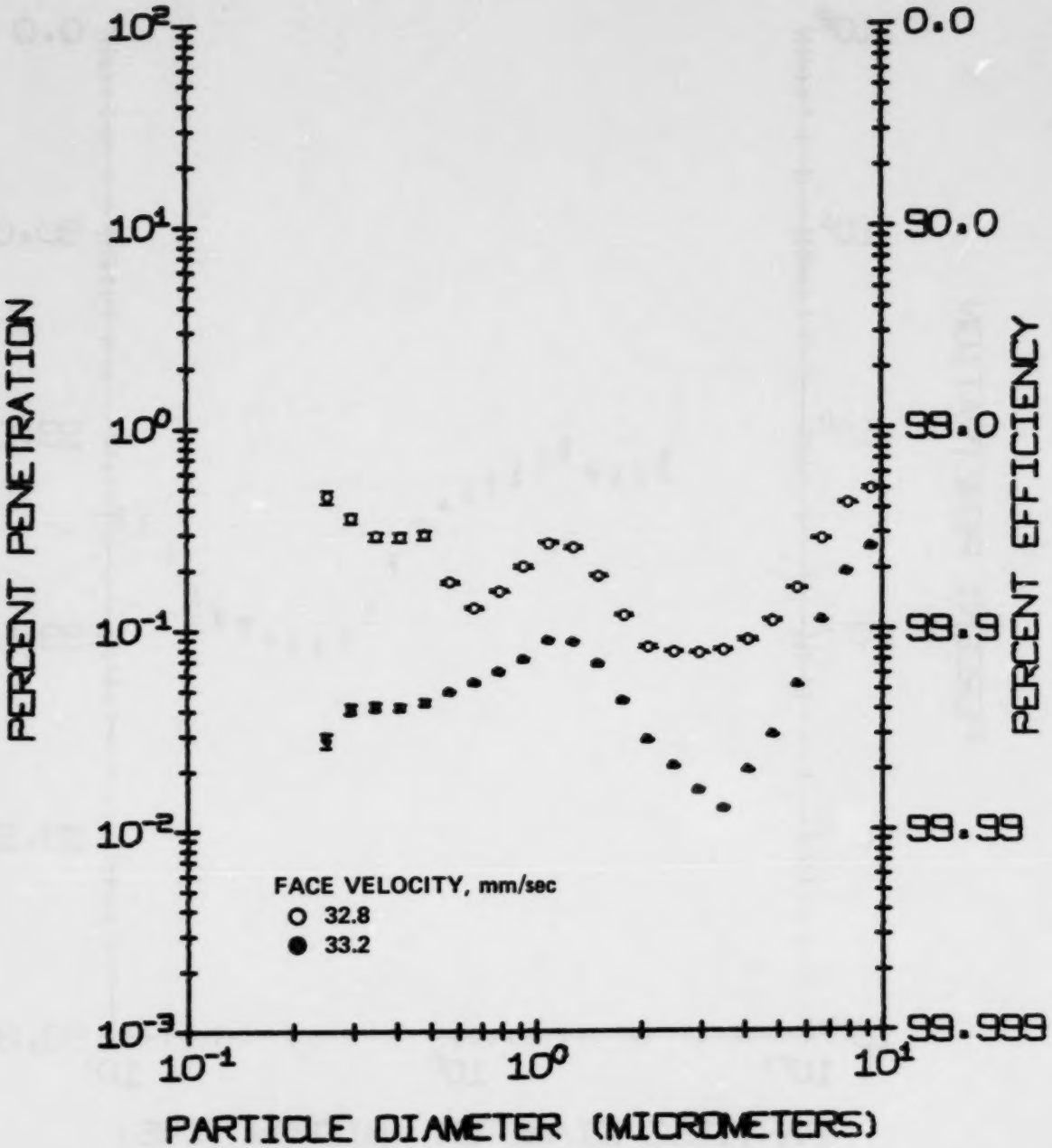

Figure 10. Apitron fractional efficiency with conditioned Teflon bags, 12/5/77–12/6/77, vs. aerodynamic particle diameter in micrometers.

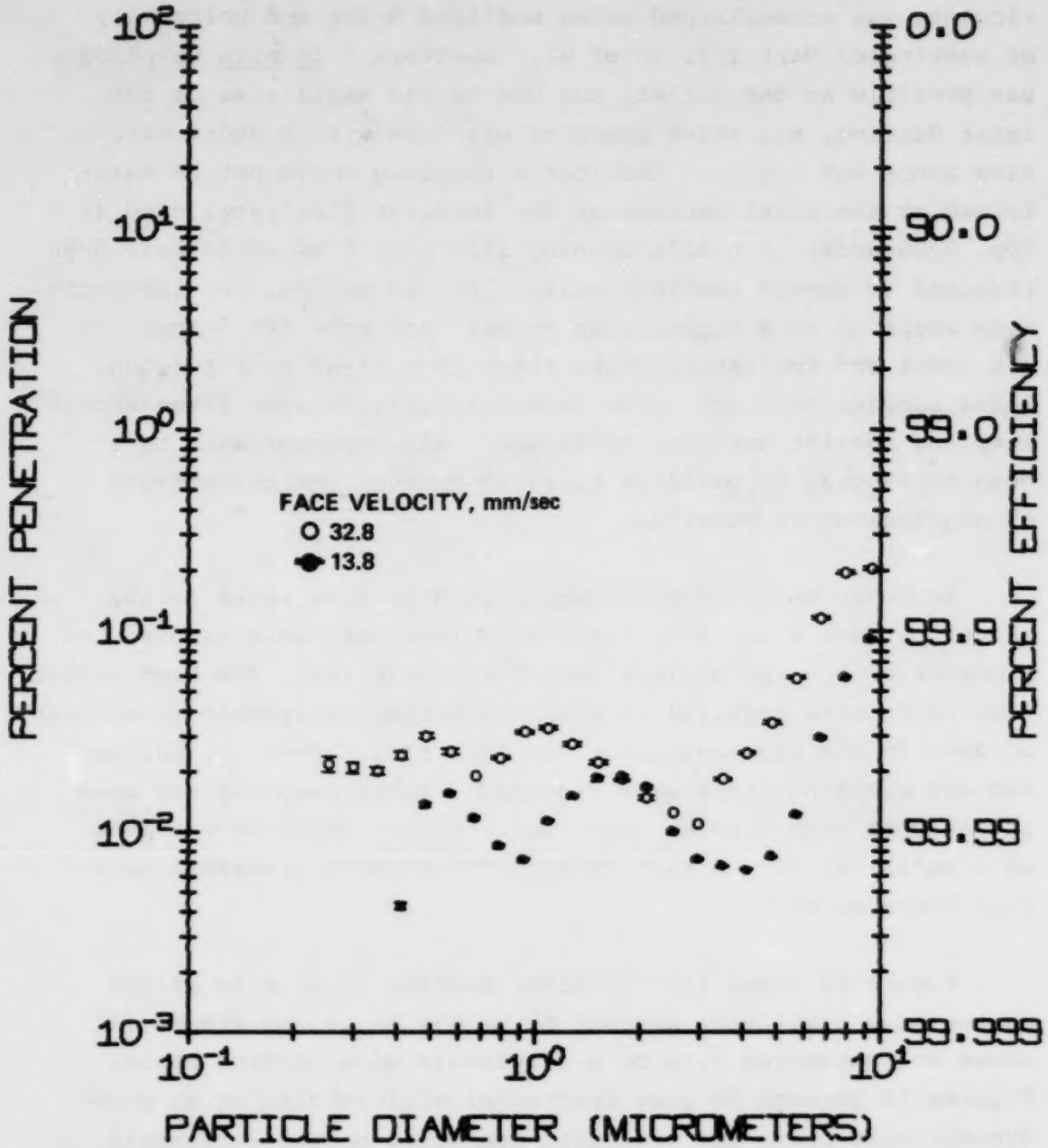

Figure 11. Apitron fractional efficiency as a conventional fabric filter (Teflon bags), 12/7/77–12/8/77, vs. aerodynamic particle diameter in micrometers.

During the tests of the full scale unit, as in the earlier mobile unit test, inertial sizing of the inlet and outlet particulate was accomplished using modified Brink and University of Washington Mark III, (U of W), impactors. In situ sampling was possible at the outlet, but due to the small size of the inlet ducting, all inlet sampling was done with a short extractive probe and nozzle. Isokinetic sampling could not be maintained at the inlet because at the impactor flow rates used (1.7 lpm, 0.06 acfm), a nozzle opening less than 1 mm would have been required to sample isokinetically. At the outlet, the impactors were operated at a higher than normal flow rate (42.5 lpm, 1.5-1.6 acfm) and the samples were taken over 24-48 hour periods. These samples were not taken isokinetically because large enough sampling nozzles were not available. All impactor data have been corrected, by particle size, to account for the effects of non-isokinetic sampling.

In order to be able to sample at high flow rates at the outlet, stages 6 and 7 of the U of W impactors were removed and a spacer of the appropriate length was inserted. The high outlet flow rates were required in order to collect weighable quantities of dust in the time available for each test. Even so, one to two day sampling times were required. Inlet sampling was done in one port with 3 point traverses. Outlet sampling was done in 2 ports, at 90° to each other. Three point traverses were used there as well.

Figure 12 shows the corrected average inlet size distribution on a cumulative percent by weight basis and Figure 13 shows corresponding data on a cumulative mass loading basis. Figures 14 through 18 show fractional efficiencies on an aerodynamic size basis for the tests conducted on the full scale unit. The data obtained during this test series shows the expected increased emissions for operation as a conventional fabric filter.

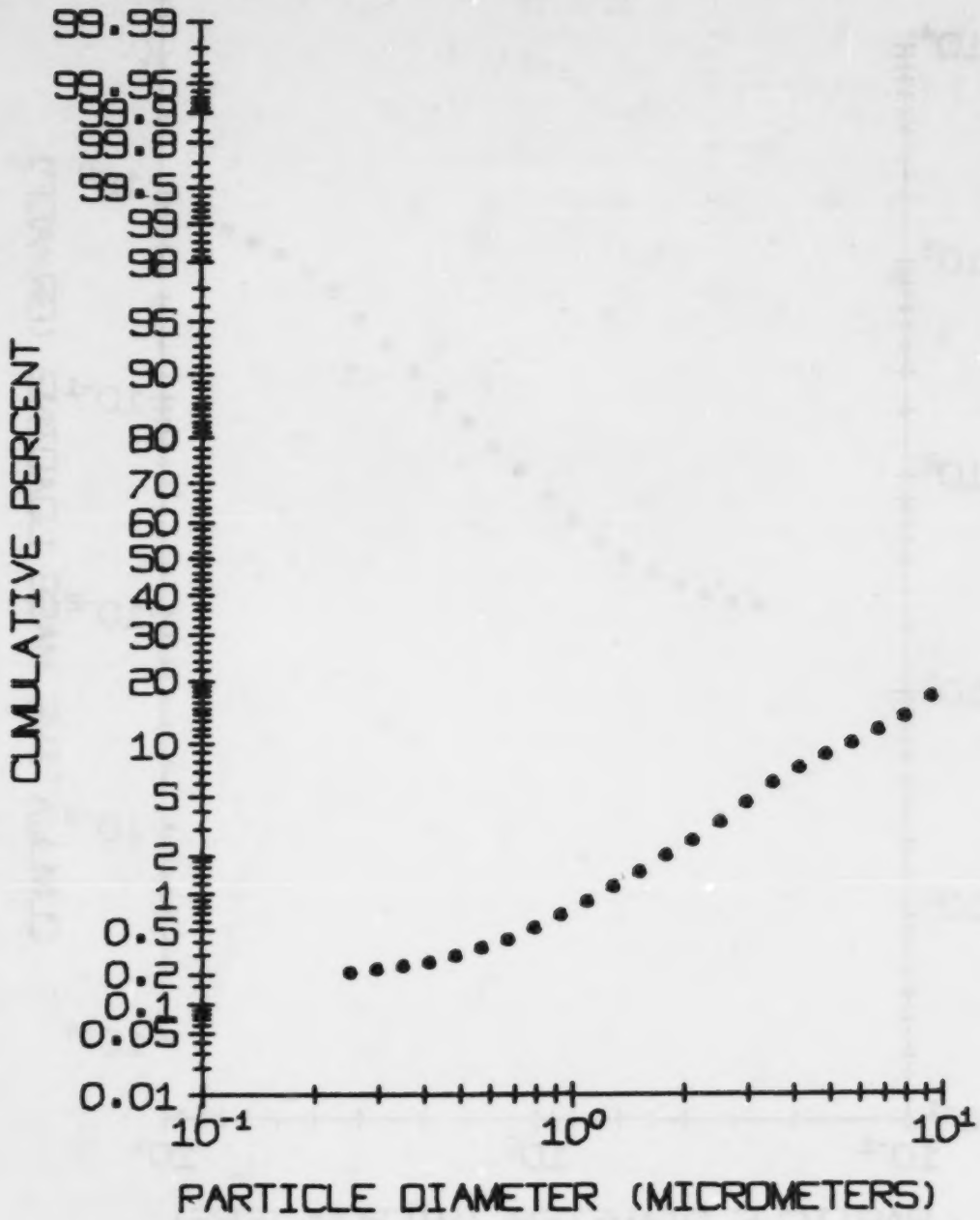

Figure 12. Average inlet size distribution for the full scale Apitron tests. Cumulative percent (by weight basis) vs. aerodynamic particle diameter in micrometers.

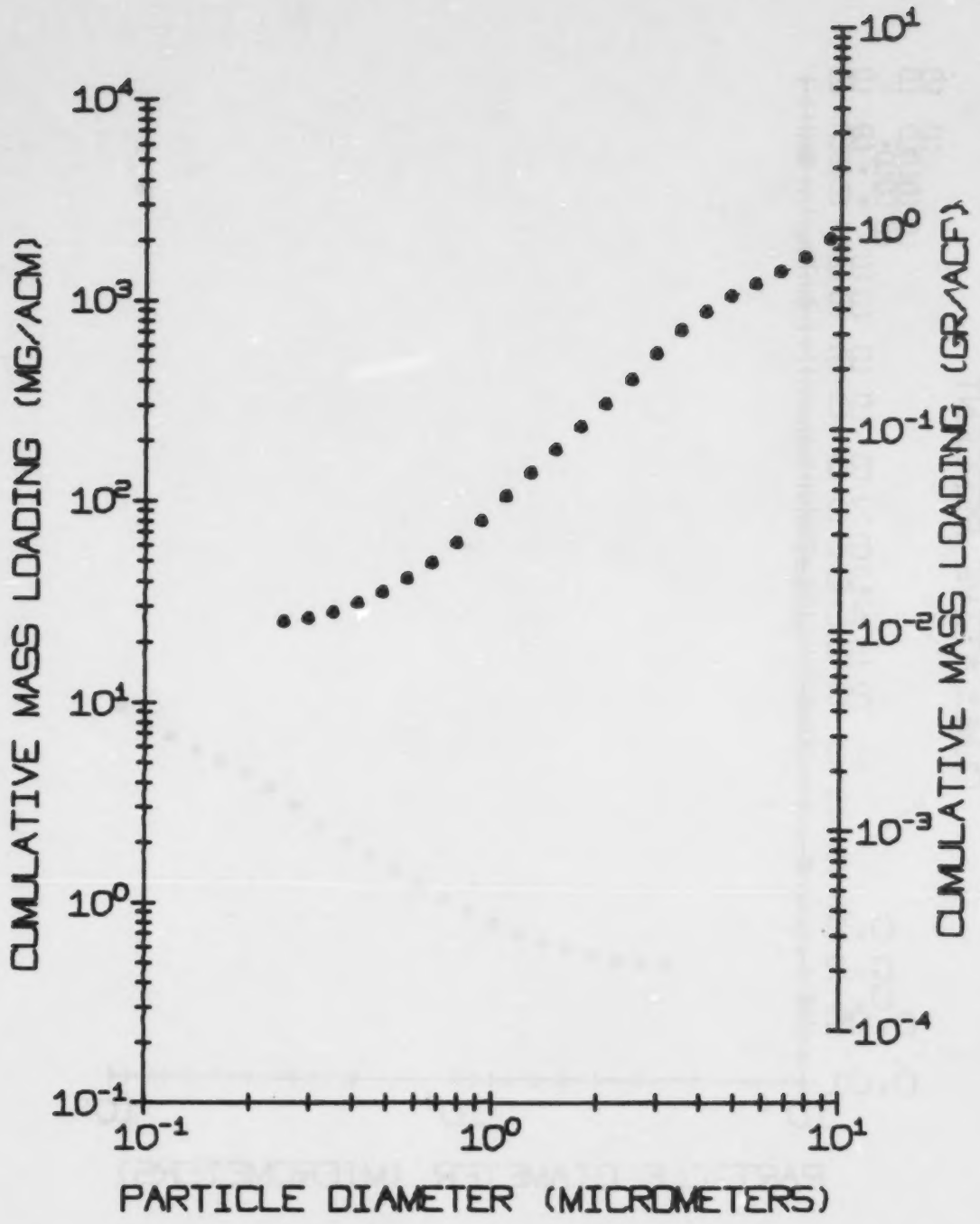

Figure 13. Average inlet size distribution for the full scale Apitron tests. Cumulative mass loading in mg/ACM vs. aerodynamic particle diameter in micrometers.

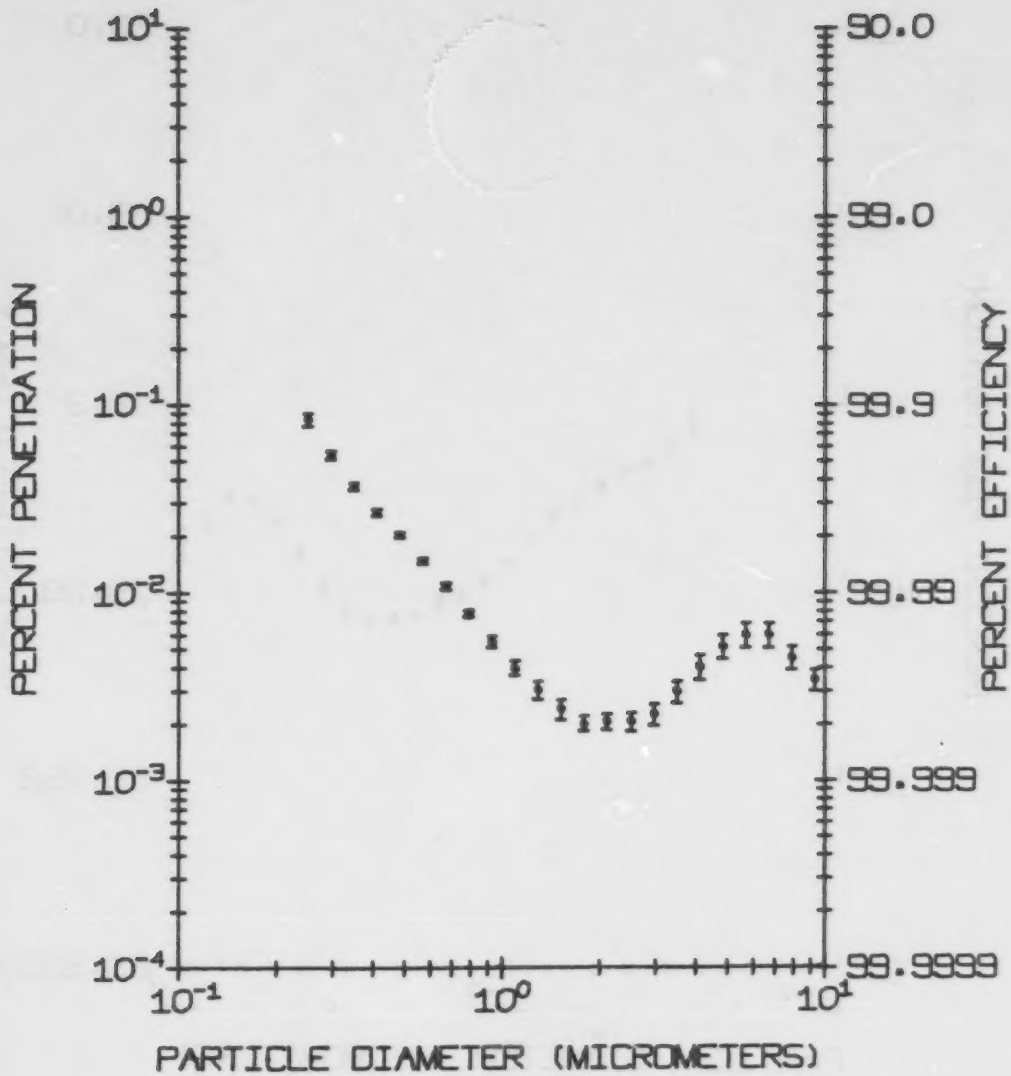

Figure 14. Fractional efficiency of the full scale Apitron dust collector vs. aerodynamic particle diameter in micrometers as determined from cascade impactor data. ESP operating at 25% of nominal maximum power.

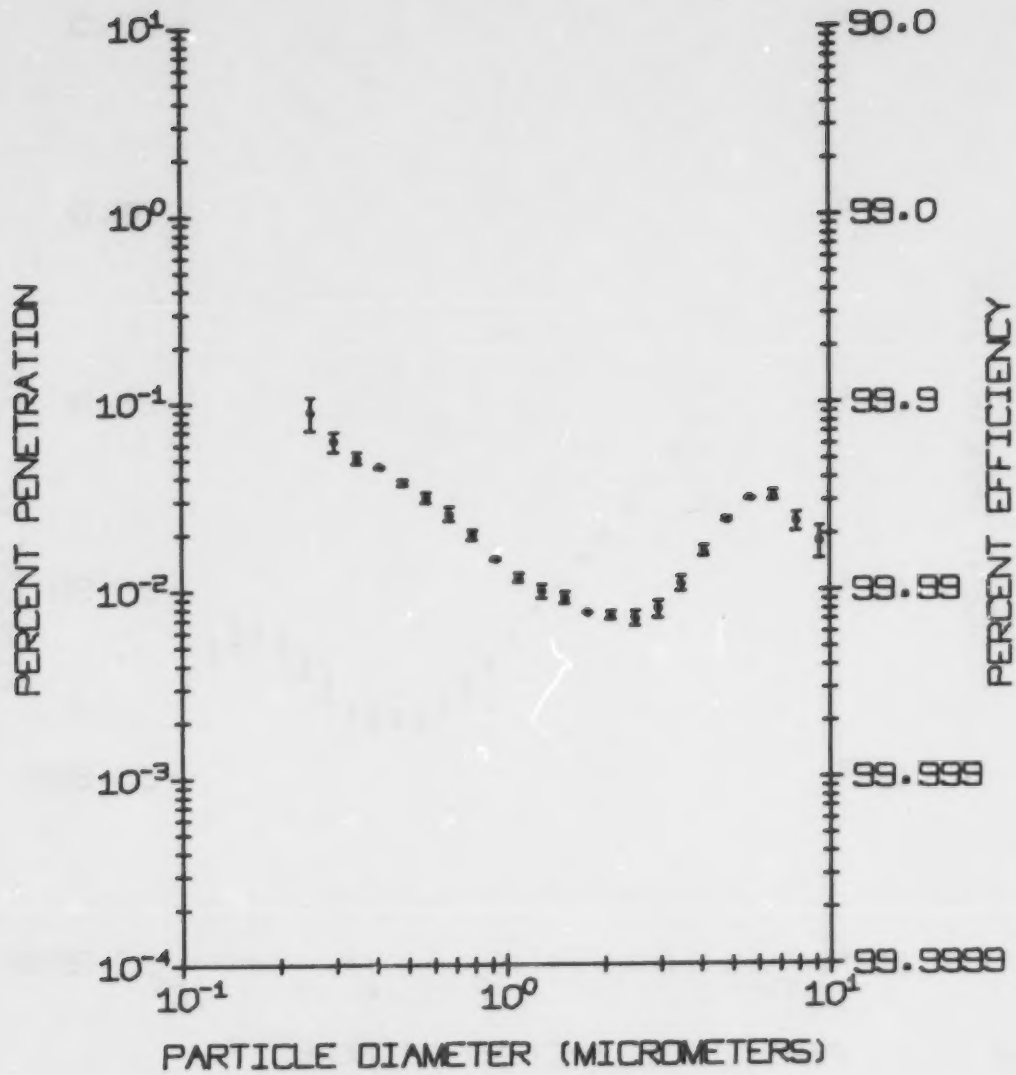

Figure 15. Fractional efficiency of a full scale Apitron unit operating as a conventional fabric filter vs. aerodynamic particle diameter in micrometers. 6/14–15/78

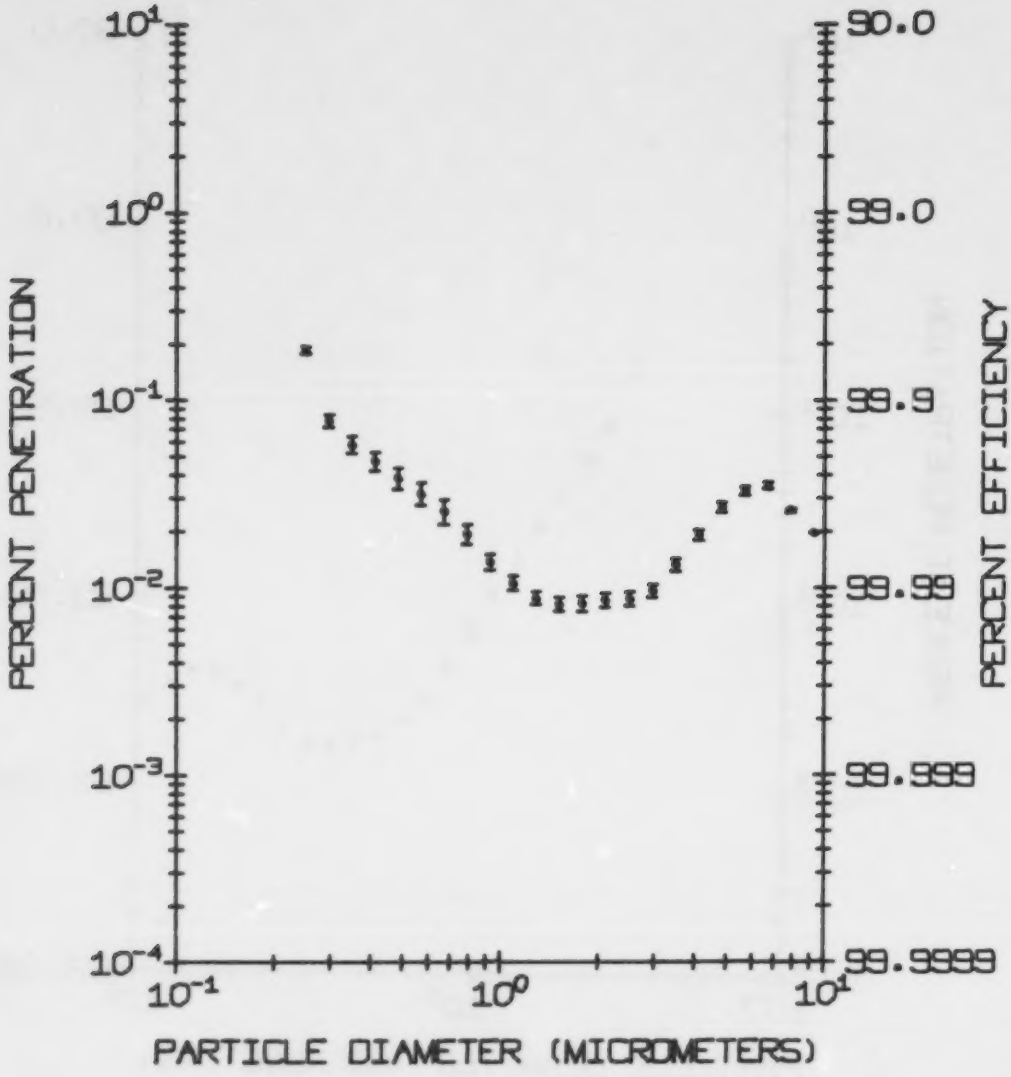

Figure 16. Fractional efficiency of a full scale Apitron unit operating as a conventional fabric filter vs. aerodynamic particle diameter in micrometers. 8/15–16/78

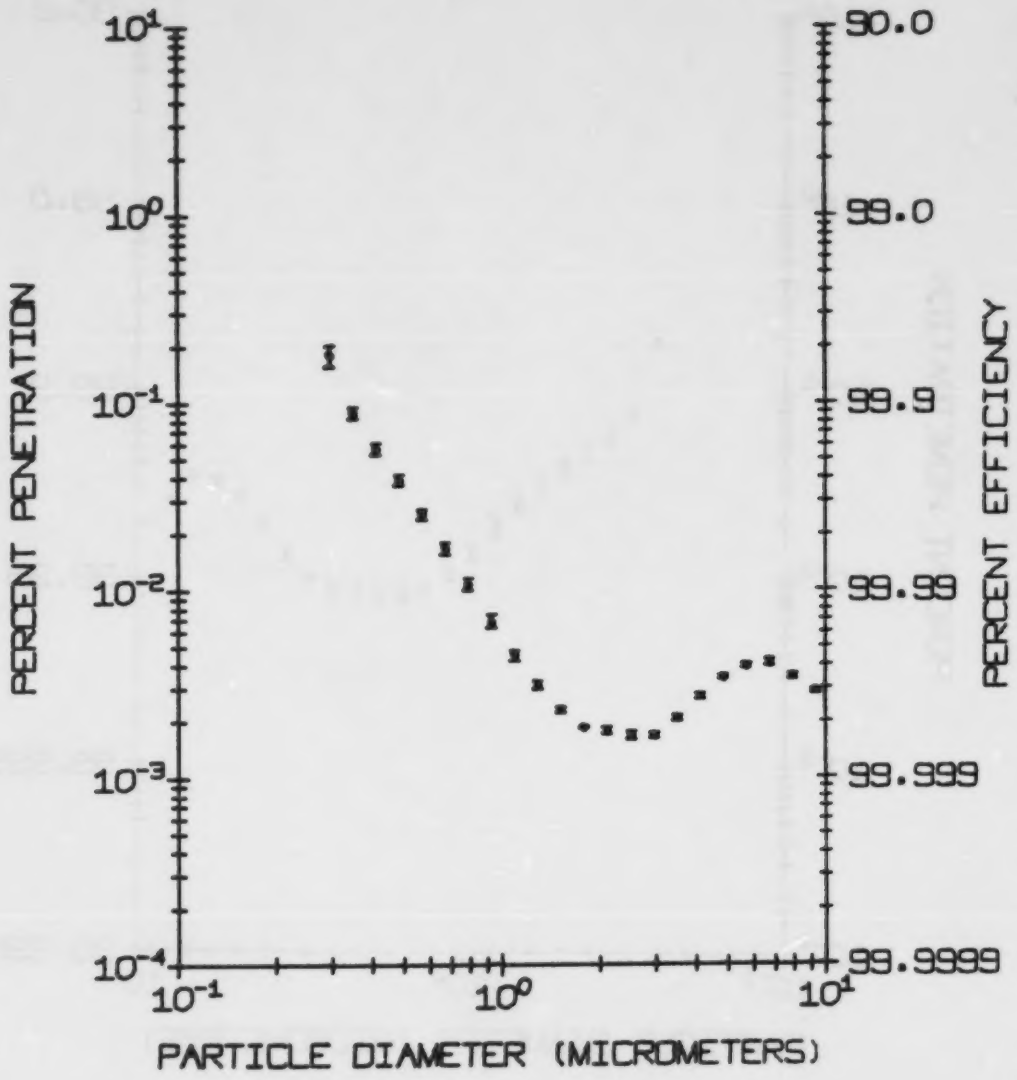

Figure 17. Fractional efficiency of a full scale Apitron unit operating as a conventional fabric filter vs. aerodynamic particle diameter in micrometers. 6/16–17/78

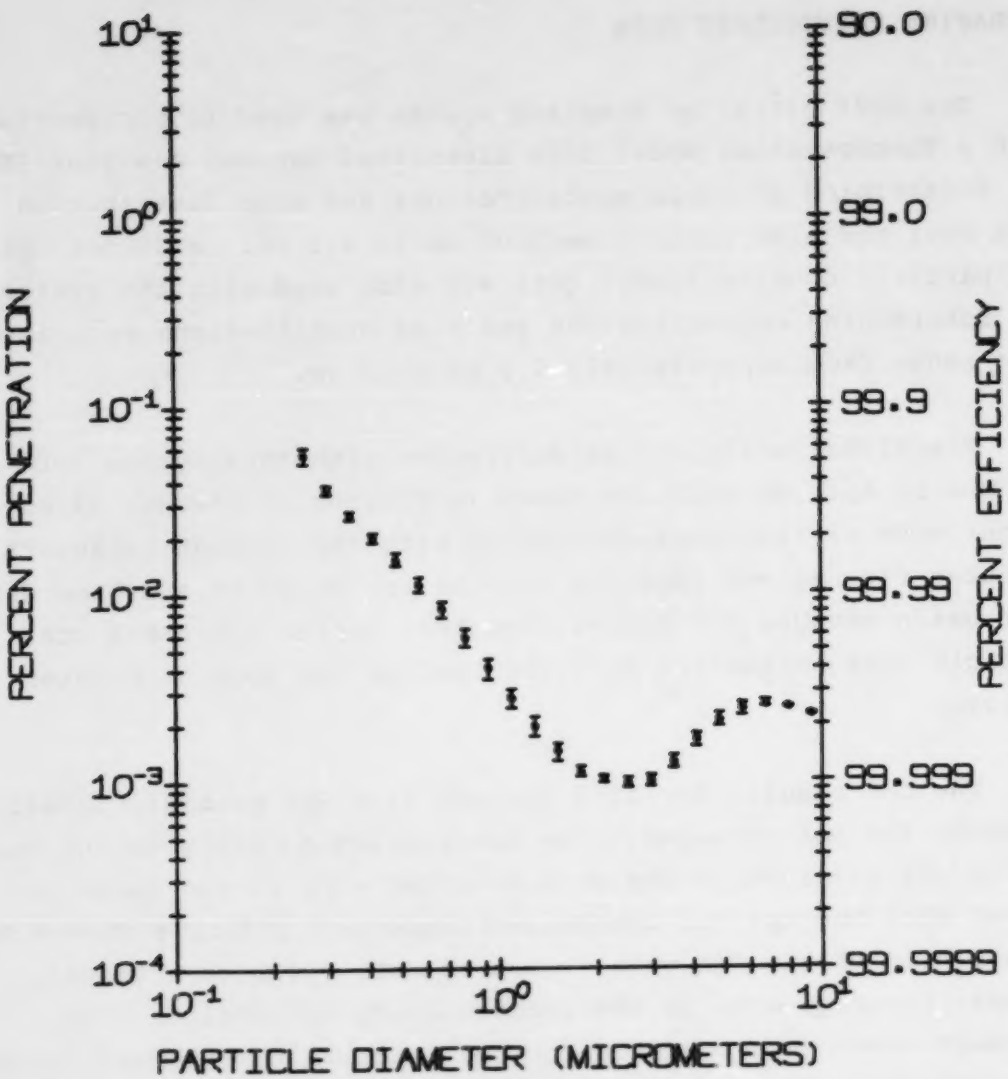

Figure 18. Fractional efficiency of the full scale Apitron unit operating at full ESP power vs. aerodynamic particle diameter in micrometers.

Complete data from all cascade impactor runs for both test series are given in the appendix.

ULTRAFINE PARTICULATE DATA

The SoRI ultrafine sampling system was used in conjunction with a Thermosystems Model 3030 Electrical Aerosol Analyzer (EAA) for determining particle concentrations and size distribution data over the size range from 0.01 μm to 0.3 μm. A Climet optical particle counter (Model 208) was also used with the system for determining concentrations and size distributions over the size range from approximately 0.3 μm to 2 μm.

Fractional efficiencies determined with this system for the mobile Apitron unit are shown in Figures 19 through 24 together with efficiencies determined with the cascade impactors. In these figures the impactor results are shown on a Stokes diameter basis because the Stokes diameters better represent the particle size parameters on which the EAA and optical counter operate.

The EAA results for 12/5 through 12/8 are probably invalid. Although the EAA appeared to be functioning normally during this period the mismatch in the data obtained with it and those obtained with the optical counter and impactors indicate otherwise. Disassembly of the EAA upon return to SoRI revealed a broken corona discharge wire in the aerosol charging section. The standard checkout procedures for the instrument performed during the tests and after return to the laboratory did not indicate any malfunction in spite of the broken wire. Usually such an occurance will be revealed by these instrument checks. From the appearance of the fractional efficiency curves the breakage is believed to have occurred over the weekend of 12/3 to 12/5 and the ultrafine results shown for tests on and after 12/5 should, as mentioned before, be disregarded.

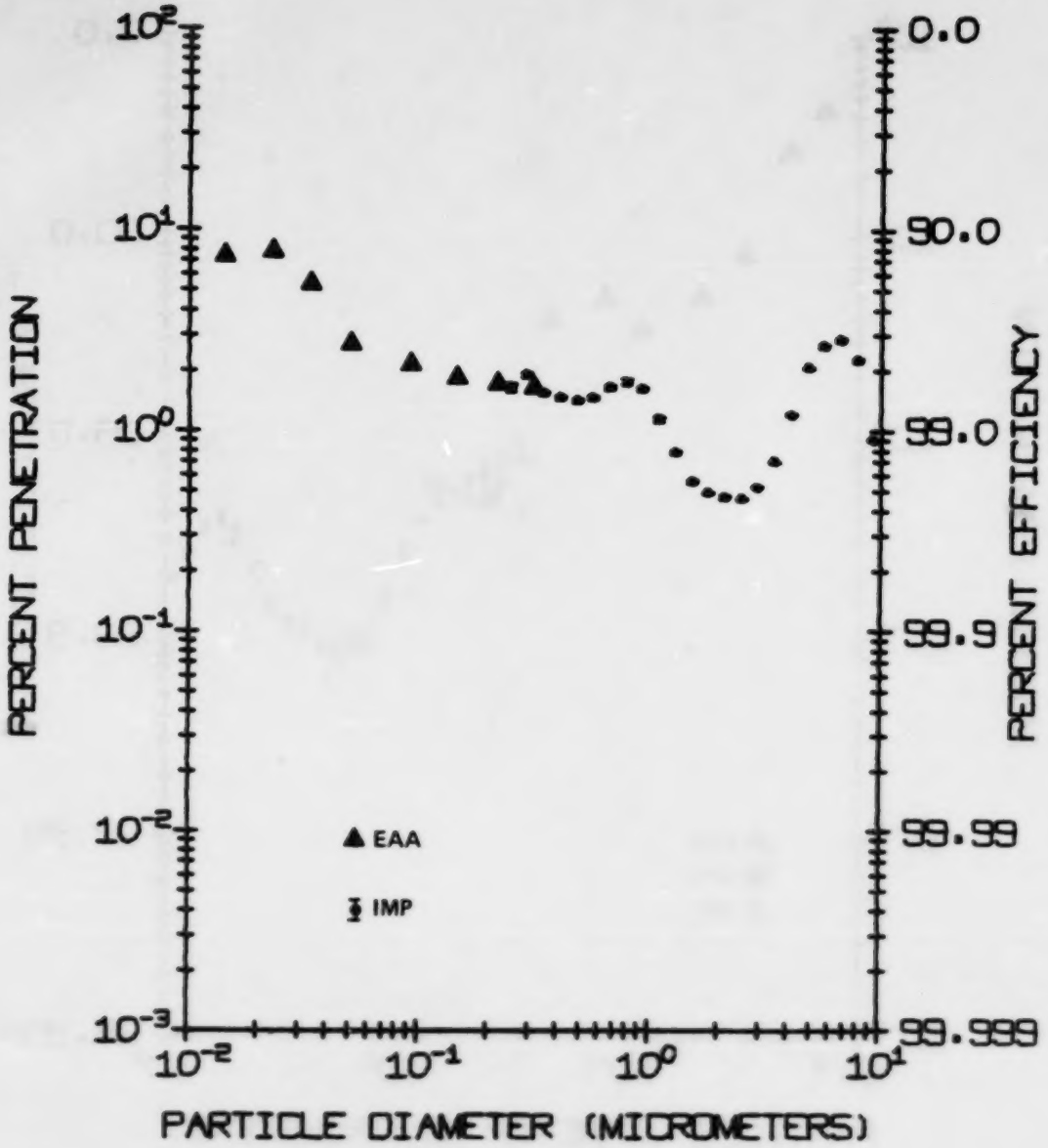

Figure 19. Apitron fractional efficiencies with aged Nomex bags, 12/1/77, vs. Stokes particle diameter in micrometers.

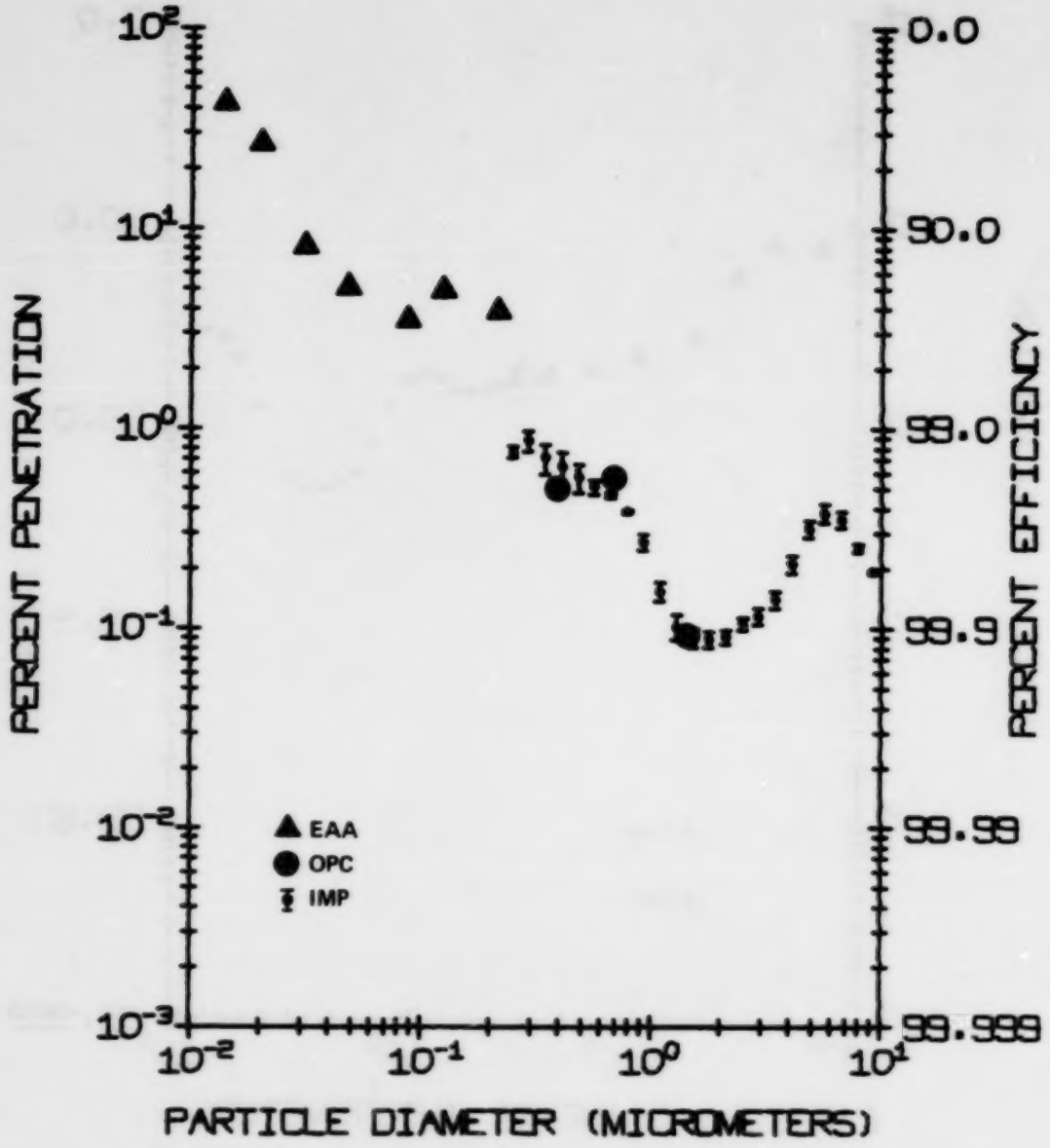

Figure 20. Apitron fractional efficiencies with new Teflon bags, 12/2/77, vs. Stokes particle diameter in micrometers.

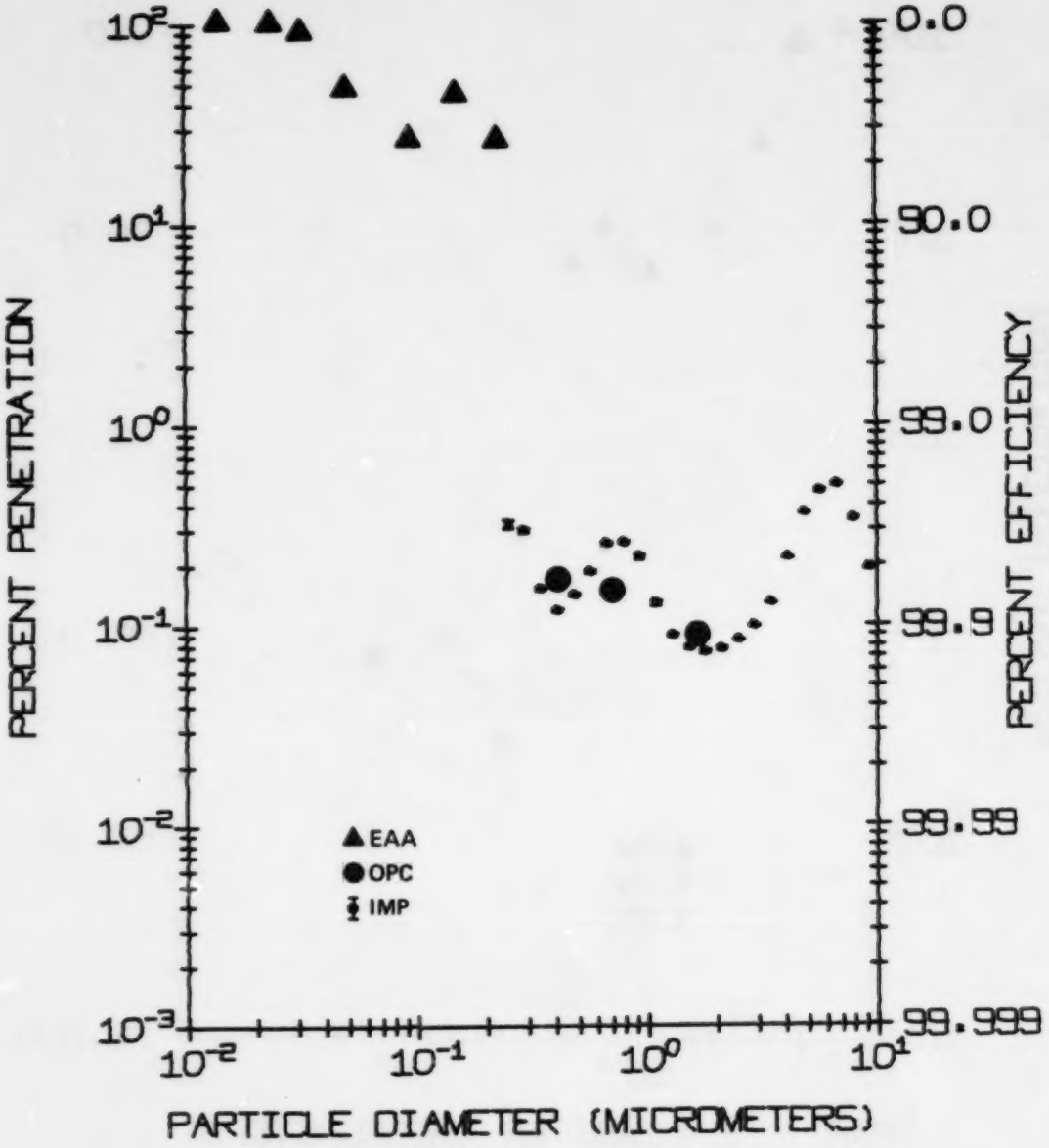

Figure 21. Apitron fractional efficiencies with conditioned Teflon bags, 12/5/77, vs. Stokes particle diameter in micrometers.

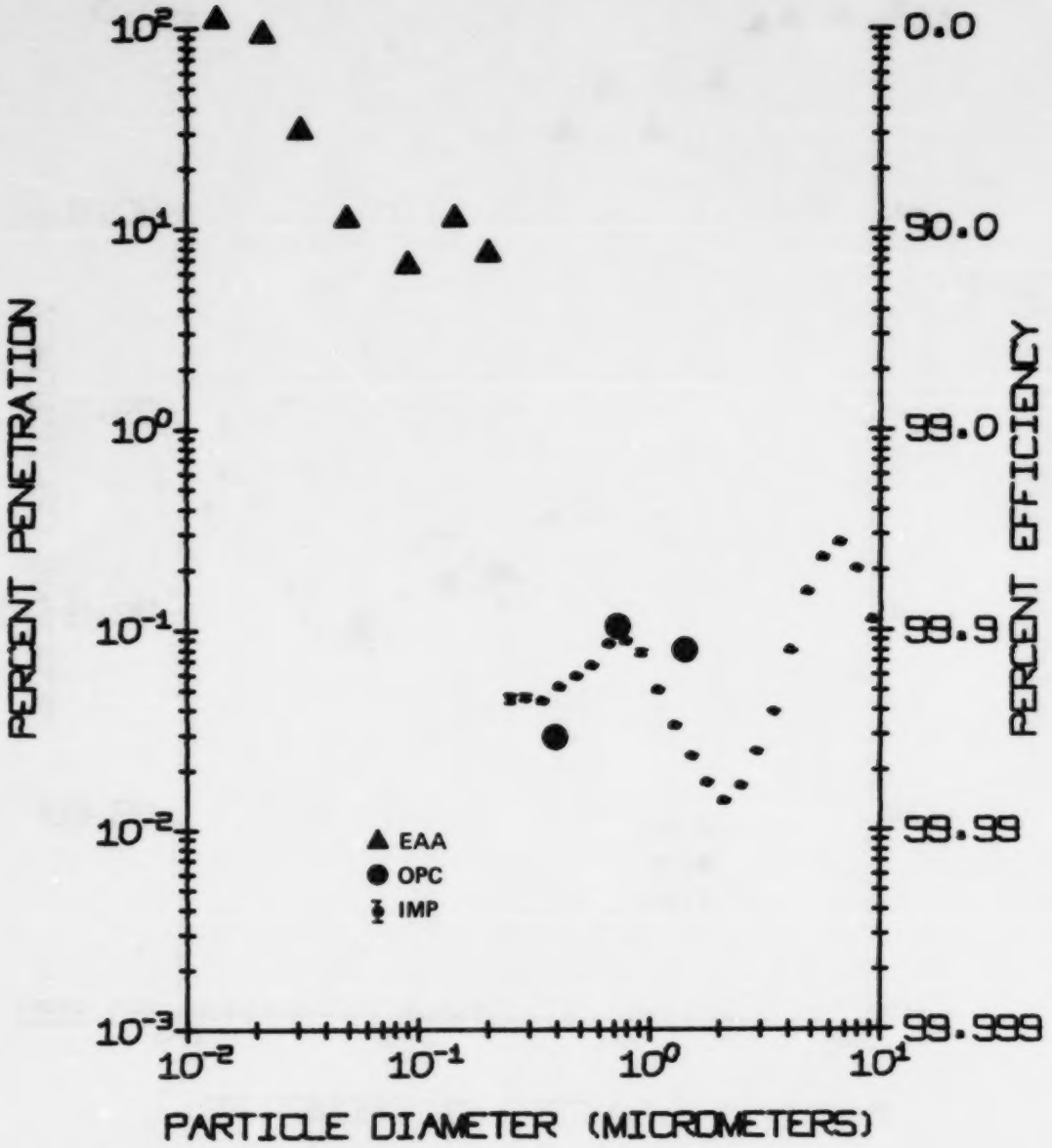

Figure 22. Apitron fractional efficiencies with conditioned Teflon bags, 12/6/77, vs. Stokes particle diameter in micrometers.

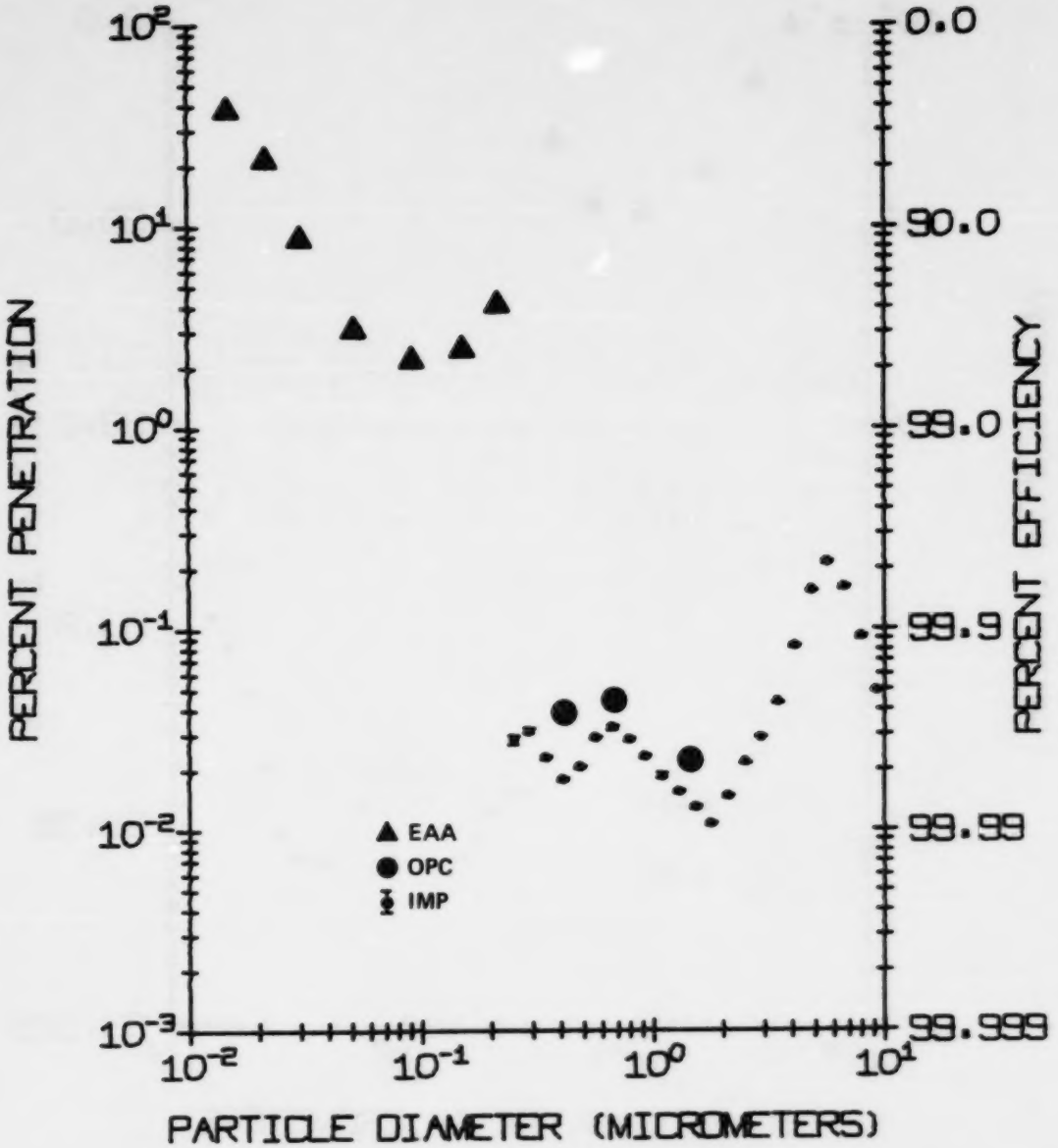

Figure 23. Apitron fractional efficiencies with conditioned Teflon bags, operated as a conventional fabric filter, 12/7/77, vs. Stokes particle diameter in micrometers.

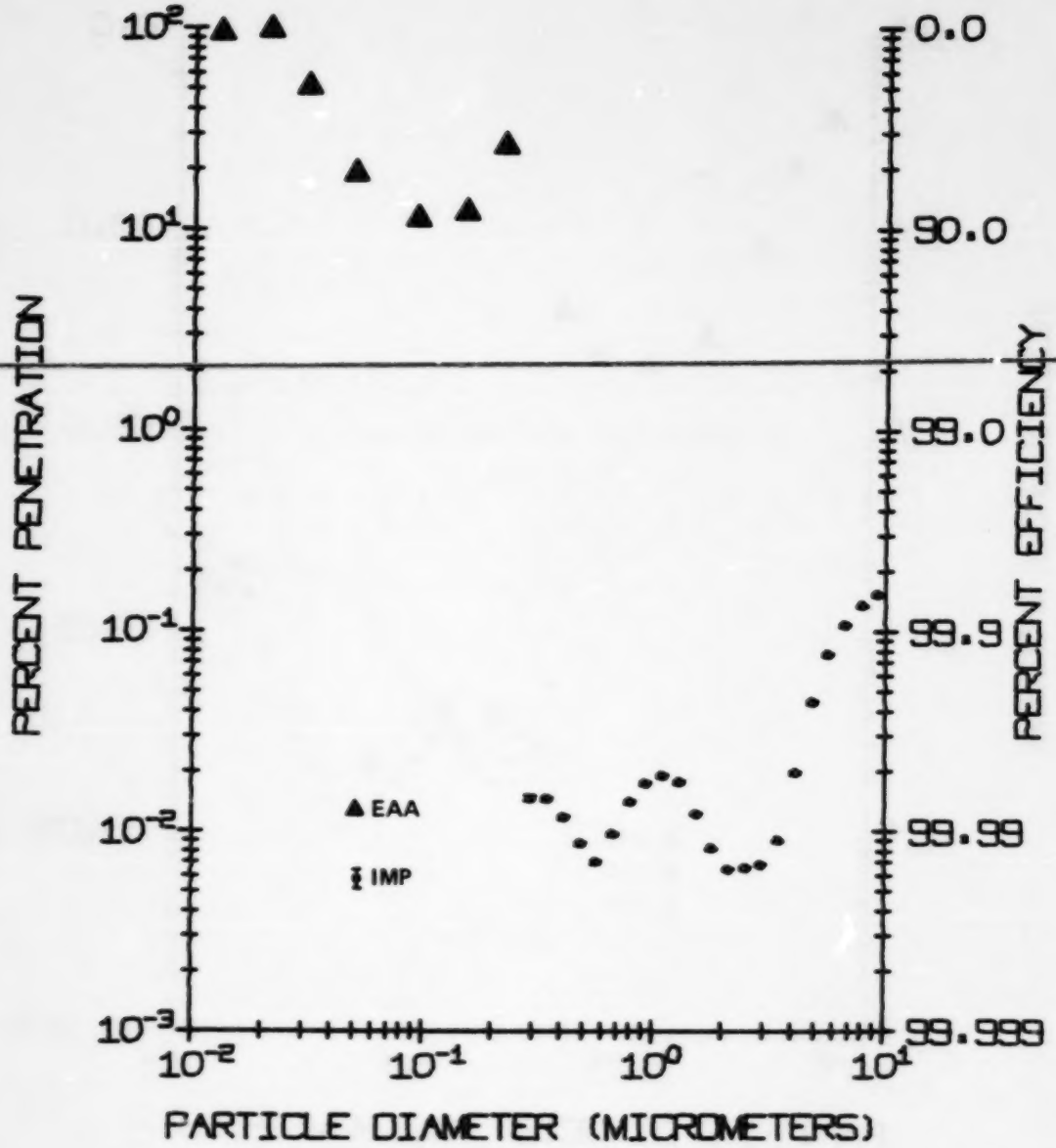

Figure 24. Apitron fractional efficiencies with conditioned Teflon bags, operated as a conventional fabric filter, 12/8/77, vs. Stokes particle diameter in micrometers.

The same system utilized in the November-December, 1977 test was used in a simplified form for the full scale unit testing. The simplifications were possible because the flue gas was ambient air at ambient conditions. Therefore, no heated probes were used, and other than dilution, no special handling of the sample stream was required. No dilution was required for outlet sampling at this location.

The redispersed silica dust was found to contain essentially no particles smaller than about 0.1 to 0.2 μm. Therefore, the ambient urban aersol was monitored without dilution upstream of the redispersed dust injection point and this urban aerosol was used to compute efficiencies in the 0.01 to 0.1 μm size range.

Figures 25-30 show the results of tests of the full scale unit with respect to efficiency from measurements made with the EAA, Climet, and cascade impactors. Again the impactor data are shown on a Stokes diameter basis. Figure 25 shows efficiency measurements made during 57 hours of 1/4 power operation on 6/12-6/14, 1978. The next 3 figures, Figures 26 through 28 show daily averages of efficiency measurements made for 3 successive days without electrostatic augmentation.

Measurements made on 6/14-15 and 6/15-16 with no augmentation show almost identical behavior with efficiencies well below that seen for power on operation. However, Figure 28 shows results which are typical of power on operation albeit at a lower face velocity. This behavior is unexplained. Continued testing by Apitron personnel during power off operation prior to and subsequent to the SRI testing consistently showed much lower efficiencies in power off than in power on operation. Testing with electrostatic augmentation at higher ESP power levels than those used on the 12th through the 14th took place on

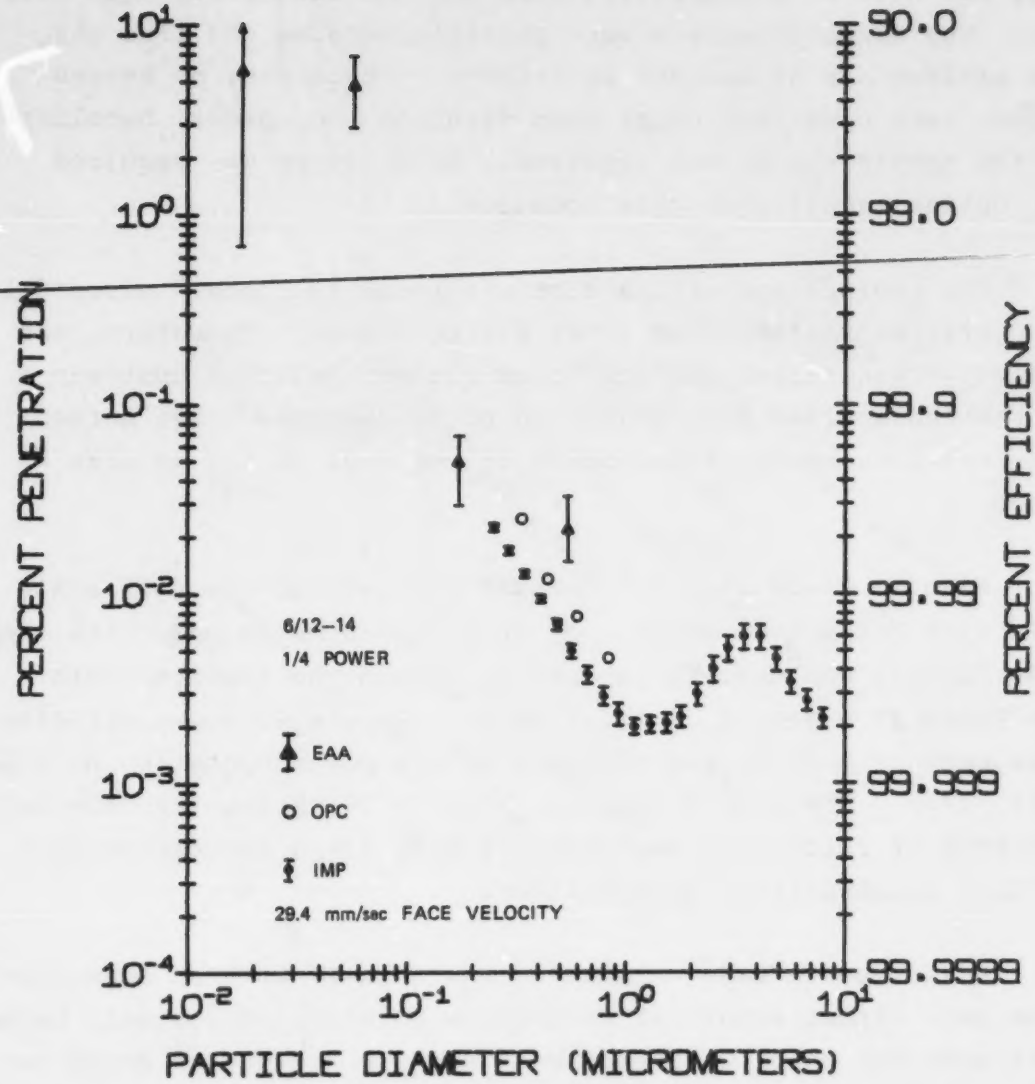

Figure 25. Fractional efficiency of the full scale Apitron unit at 25% electrical energization vs. Stokes particle diameter in micrometers.

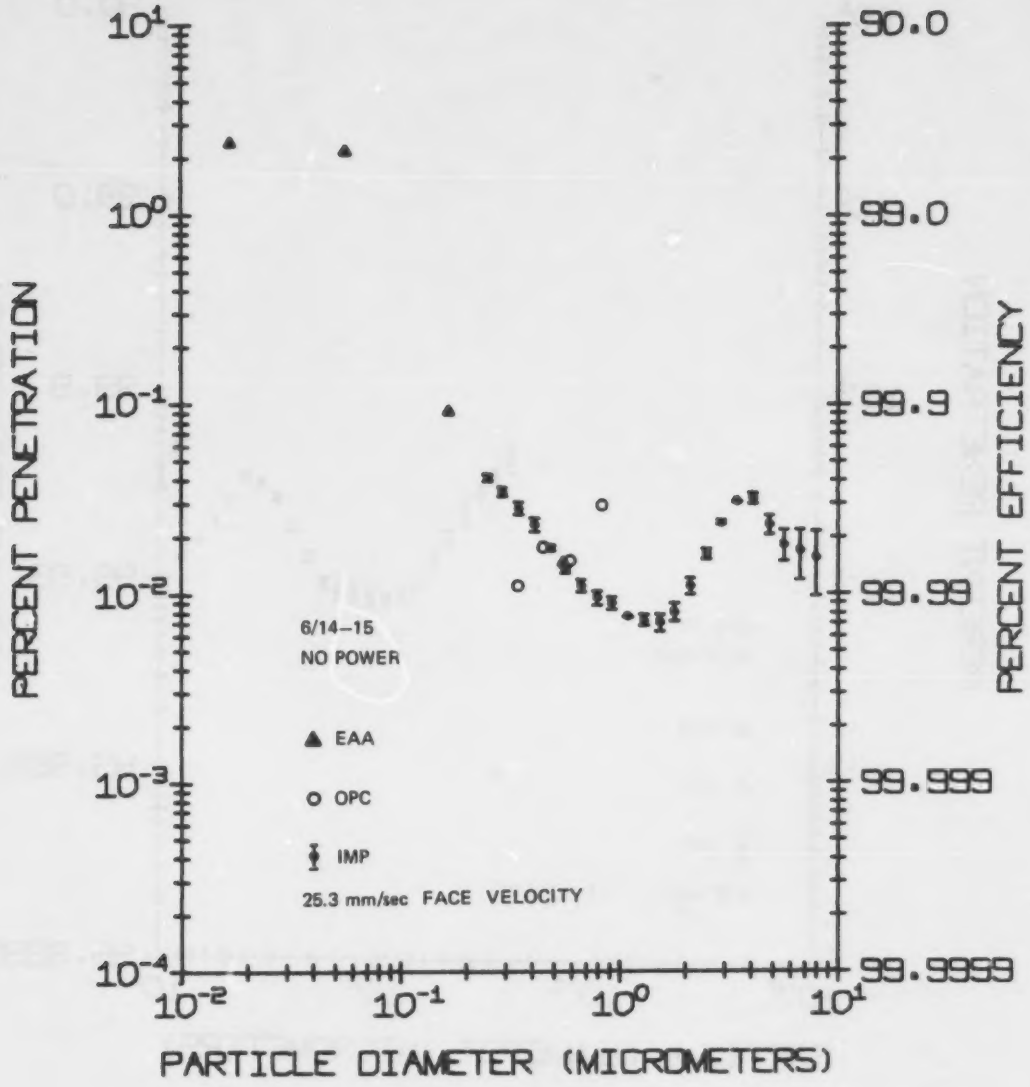

Figure 26. Fractional efficiency of the full scale Apitron unit operated as a conventional baghouse vs. Stokes particle diameter in micrometers.

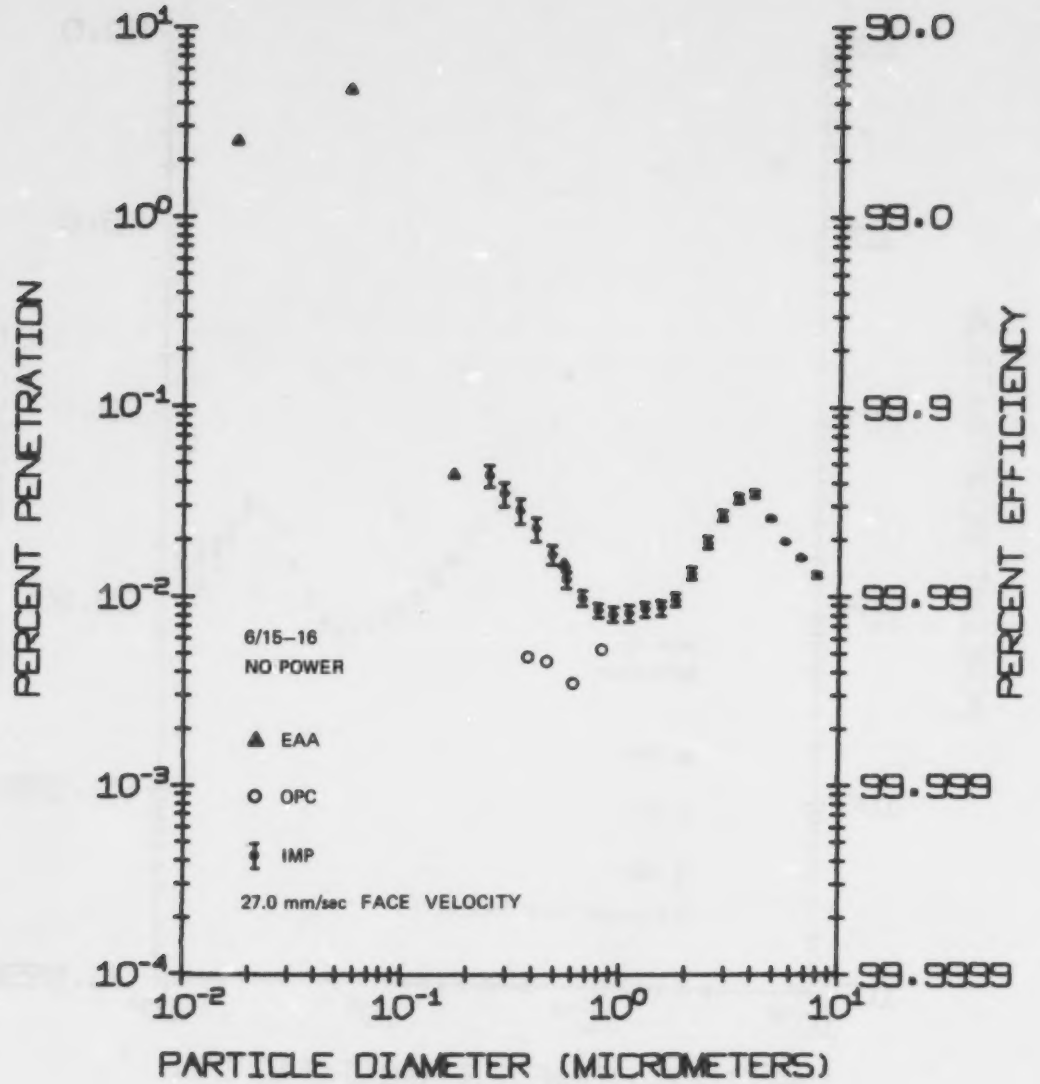

Figure 27. Fractional efficiency of the full scale Apitron unit operated as a conventional baghouse vs. Stokes particle diameter in micrometers.

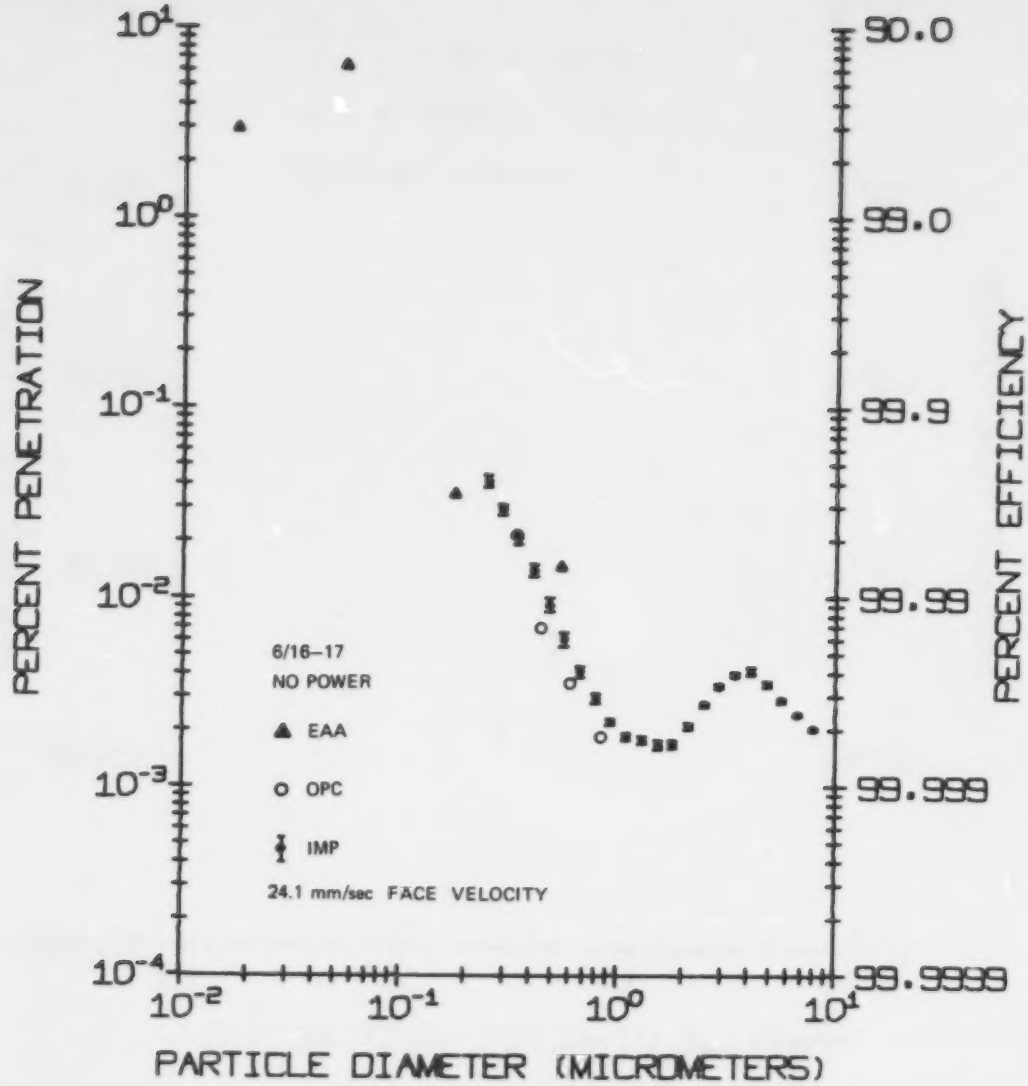

Figure 28. Fractional efficiency of the full scale Apitron unit operated as a conventional baghouse vs. Stokes particle diameter in micrometers.

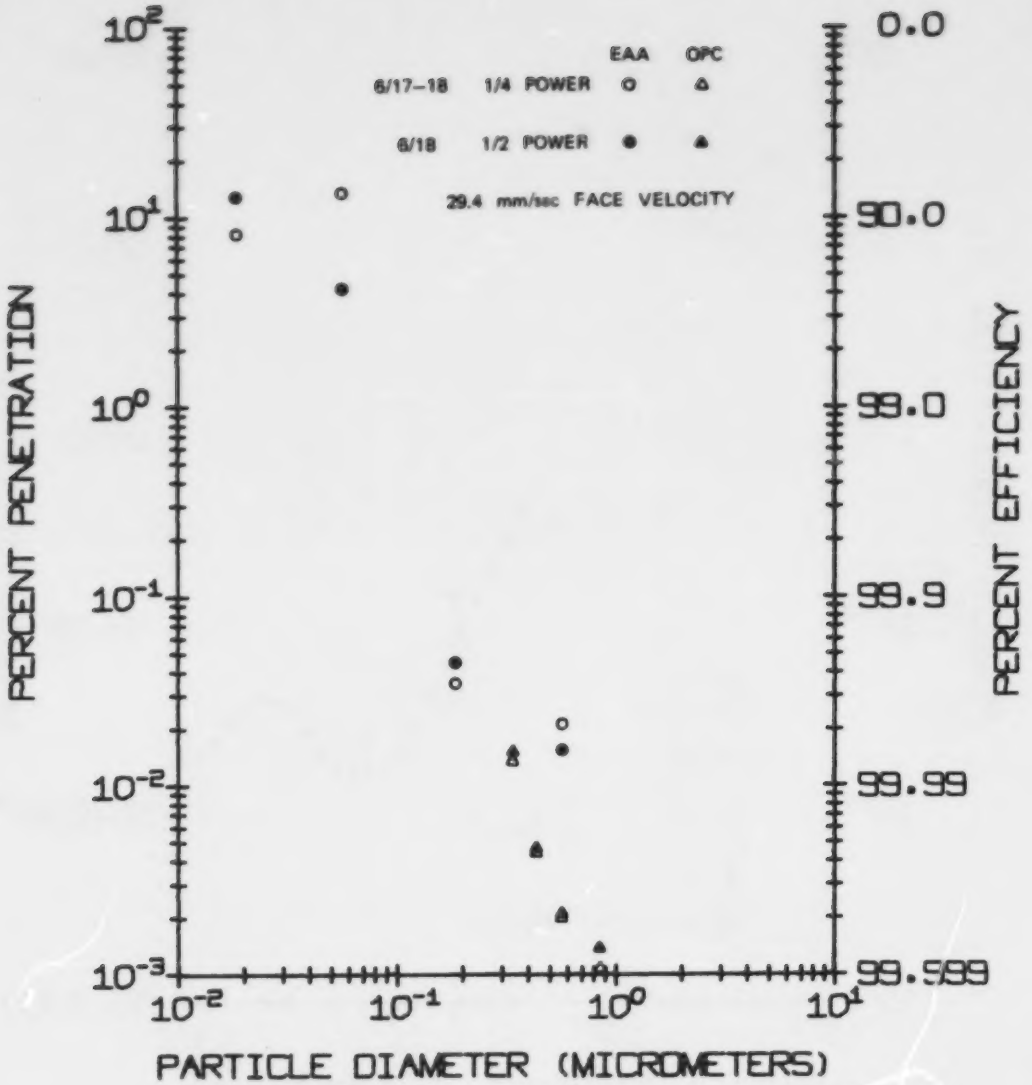

Figure 29. Fractional efficiency of the full scale Apitron unit at 25% and 50% electrical energization vs. Stokes particle diameter in micrometers.

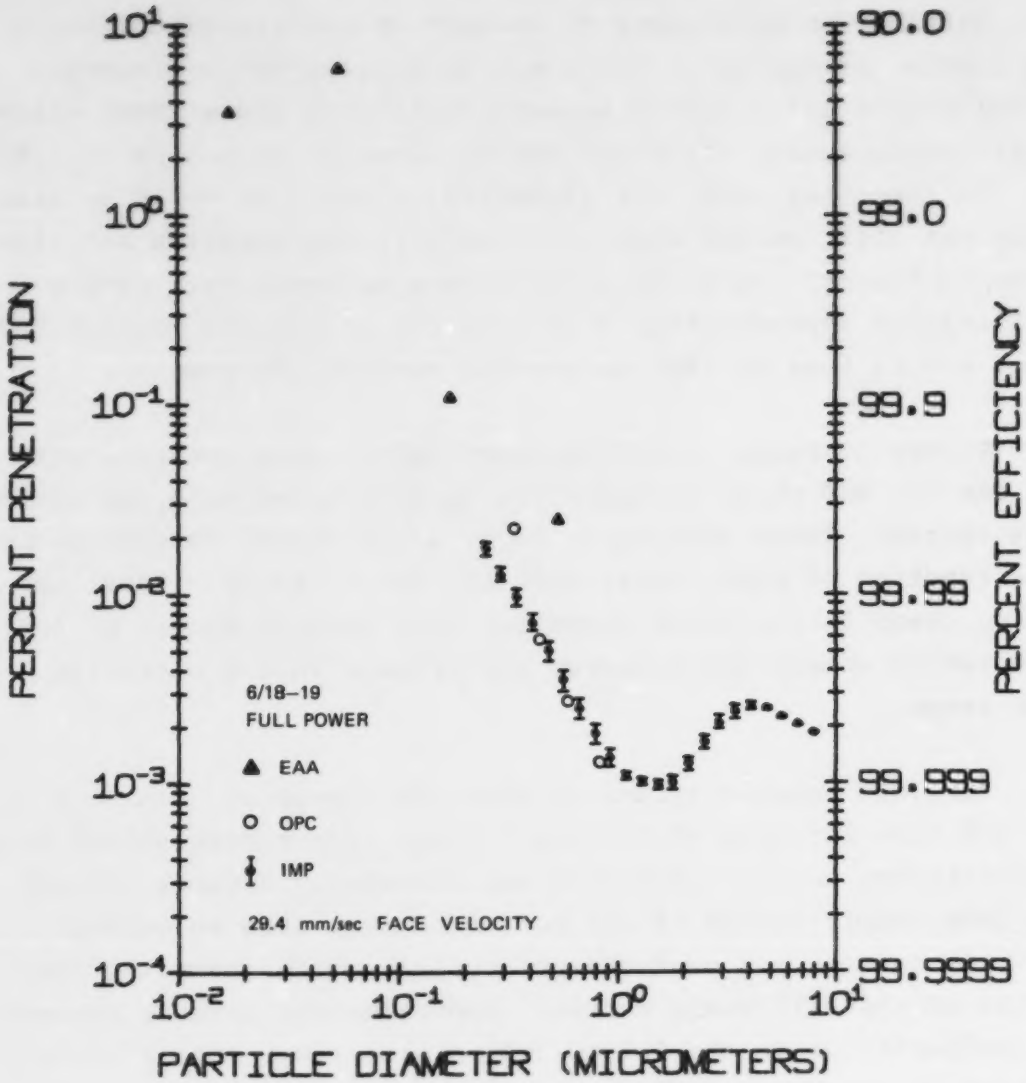

Figure 30. Fractional efficiency of the full scale Apitron unit at full electrical energization vs. Stokes particle diameter in micrometers.

June 18/19. These results showed similar ultrafine efficiencies but somewhat higher efficiencies for larger particles than the data from June 12/14.

Examination of Figures 25 through 30 reveals that, within the scatter of the data, there are no significant differences in collection efficiencies between tests with and without electrostatic augmentation for sizes smaller than about 0.5 μm to 1.0 μm. On the other hand, for diameters in the 1 μm to 10 μm size range the efficiencies with electrostatic augmentation are significantly higher. Particle penetrations in these size ranges were reduced approximately 6 fold at 25% of nominal maximum ESP power and 10 fold at 100% of nominal maximum ESP power.

Figure 31 summarizes efficiency information obtained with the EAA for ESP power on operation as determined with the ultrafine system. There appears to be no great change in efficiency as a function of power level over the range tested. Thus, the energy usage during these tests may have been in excess of that required to obtain the measured performance in the ultrafine size range.

Particle concentrations in both the ultrafine (dia. $\leq$ 0.1 μm) and fine particle (0.1 $\leq$ dia $\leq$ 3 μm) size ranges showed large concentration swings related to bag cleaning. Figures 32a and 32b show sample traces of the output signals from an optical particle counter and condensation nuclei counter sampling the outlet of the full scale system. Approximately seventy percent of the particles in the 0.5 to 1.5 μm size range appear to be emitted in "cleaning puffs".

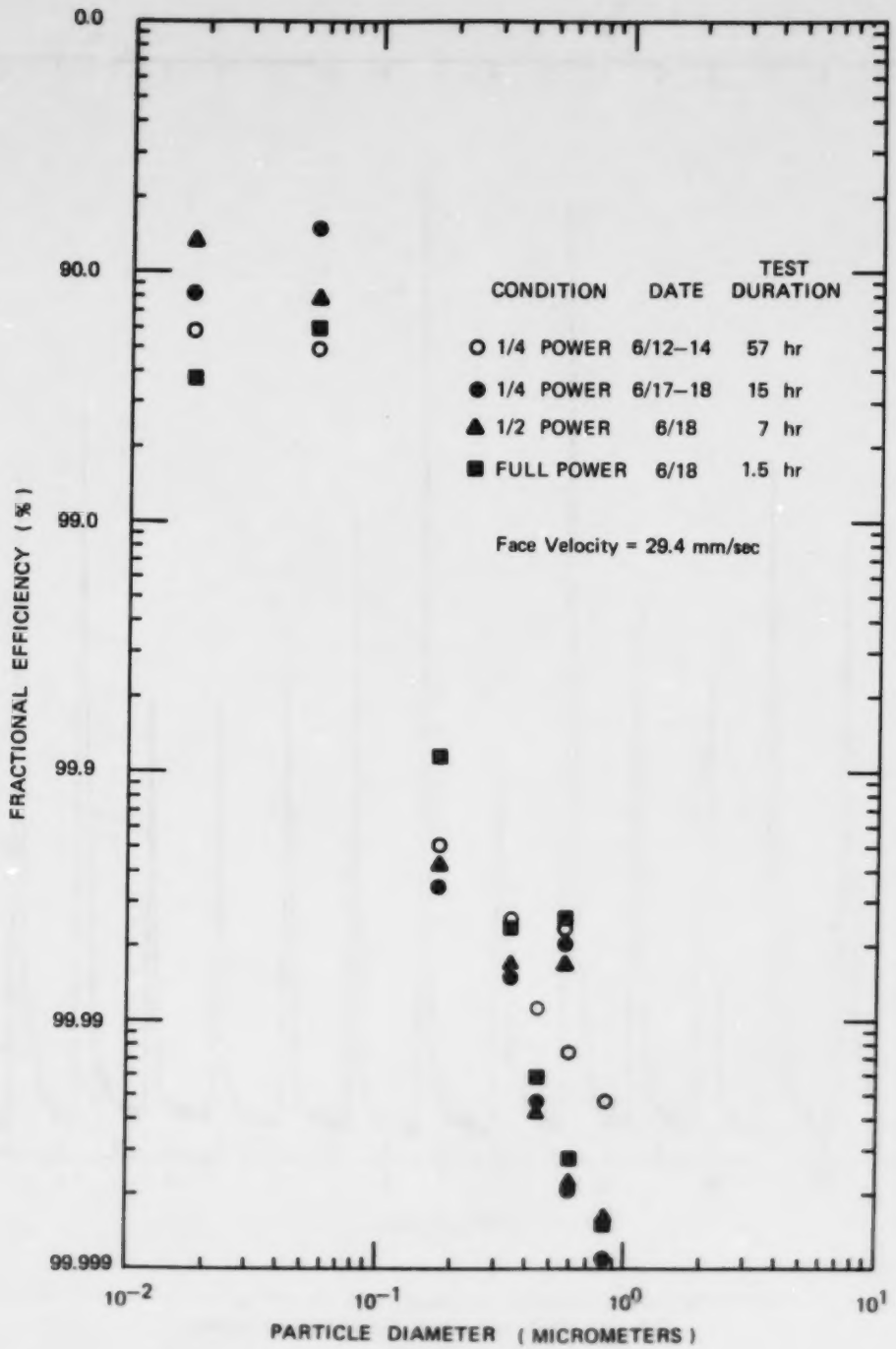

Figure 31. Full scale Apitron fine particle fractional efficiency at various ESP power levels vs. Stokes particle diameter in micrometers.

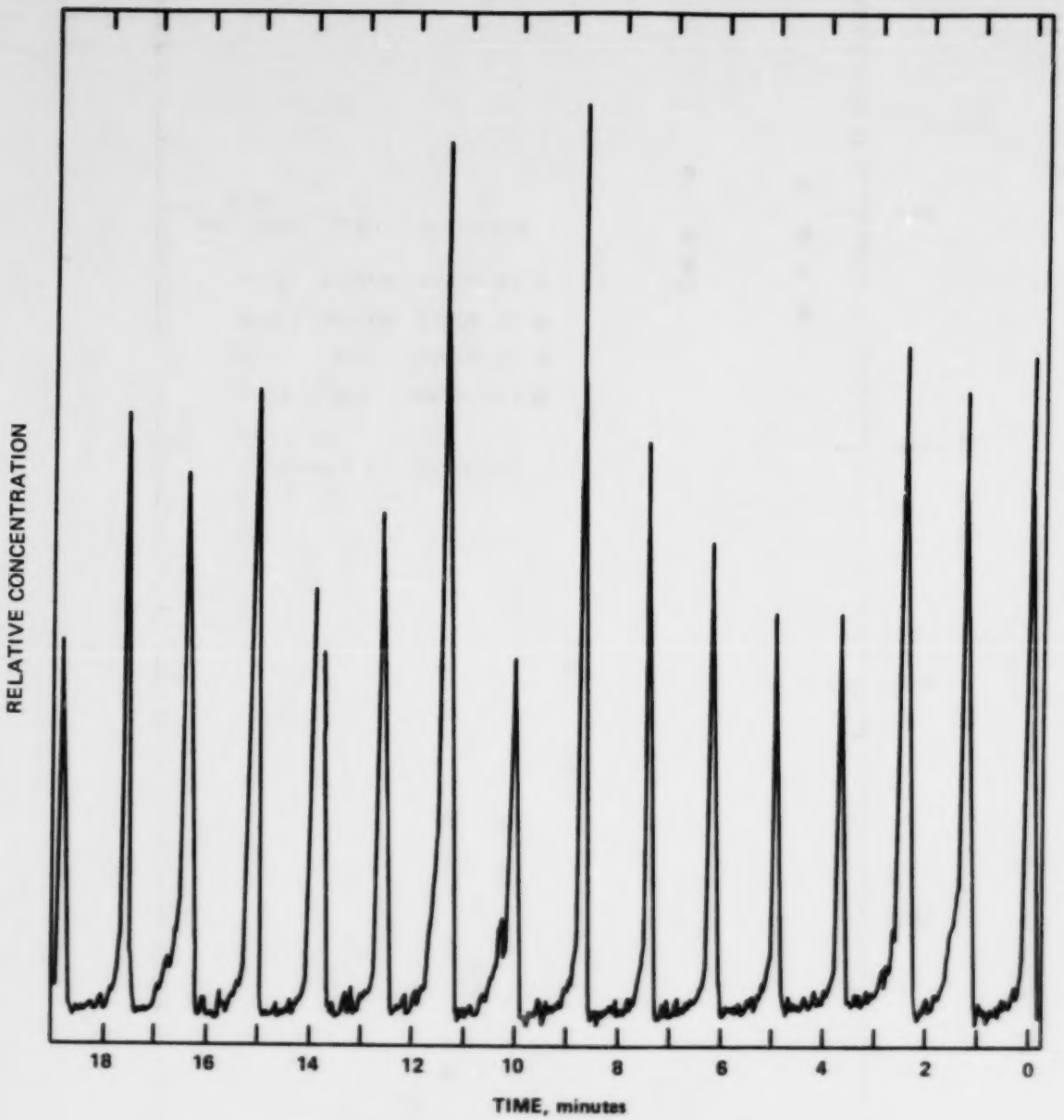

Figure 32a. Outlet concentration variations in the 0.5 to 1.5 micrometer size range. Concentration spikes are the result of bag cleaning.

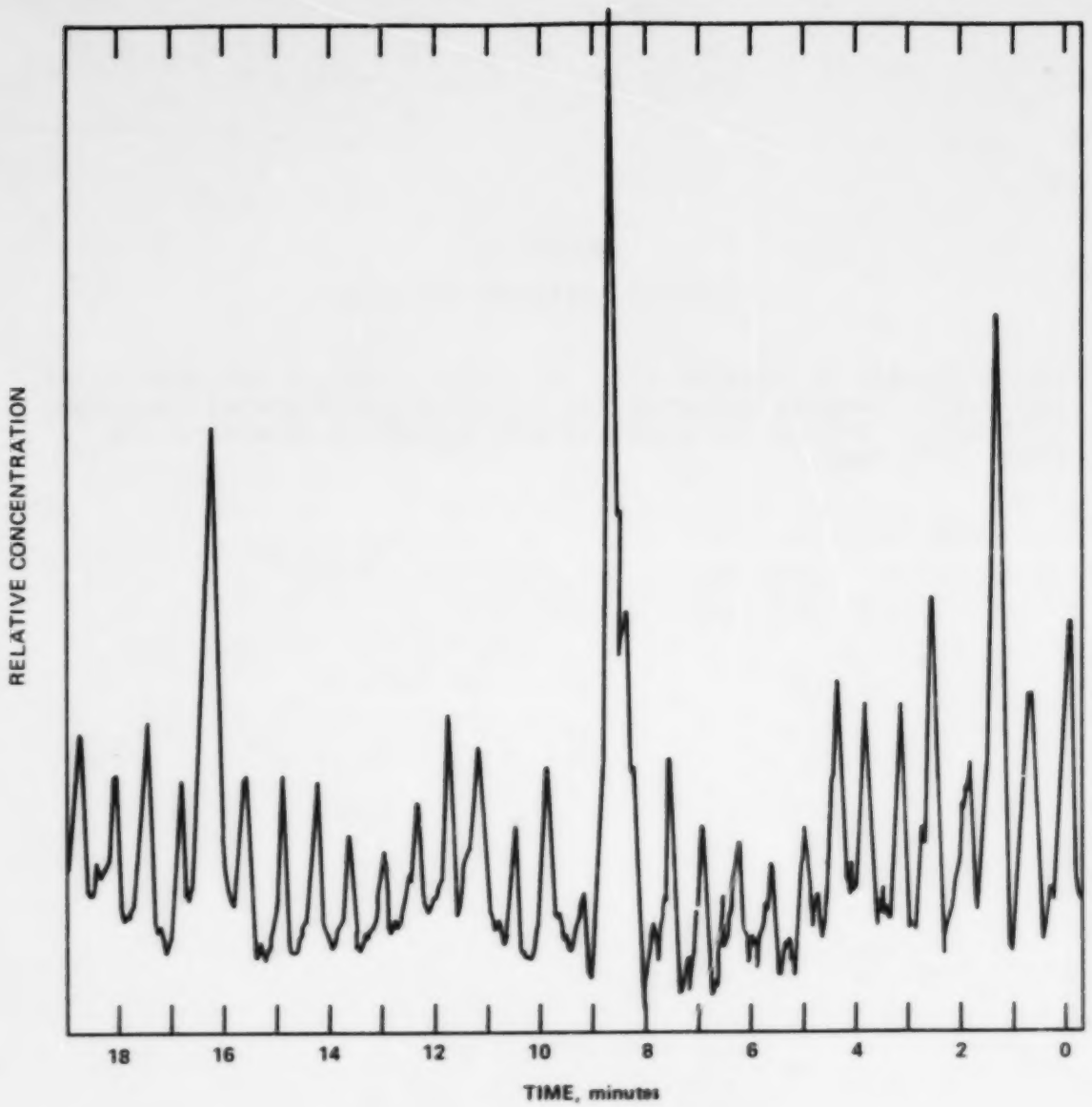

Figure 32b. Outlet concentration variations in the 0.01 to 0.2 micrometer size range. Major increases follow the cleaning of bags.

APPENDIX

CASCADE IMPACTOR RUN DATA

This appendix is divided into two parts. Part 1 contains inlet and outlet cascade impactor run data for the November-December, 1977 test. Part 2 contains the corresponding data from the June, 1978 test.

PART 1

CASCADE IMPACTOR RUN DATA

November-December, 1977 Test

AVCI-1 12-1-77 1539 - 1639 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER - A

IMPACTOR FLOWRATE = 0.027 ACFM IMPACTOR TEMPERATURE = 310.0 F = 154.4 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 310.0 F = 154.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.72 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 11.07 CO = 0.00 N2 = 73.81 O2 = 7.38 H2O = 7.74

CALC. MASS LOADING = 7.9561E-01 GR/ACF 1.3062E+00 GR/DNCF 1.8206E+03 MG/ACM 2.9889E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.26	4.06	2.65	1.66	0.90	0.32	
MASS (MILLIGRAMS)	13.35	11.35	8.42	3.94	2.47	0.91	1.01
MG/DNCM/STAGE	9.63E+02	8.18E+02	6.07E+02	2.84E+02	1.78E+02	6.56E+01	7.28E+01
CUM. PERCENT OF MASS SMALLER THAN D50	67.79	40.41	20.10	10.59	4.63	2.44	
CUM. (MG/ACM) SMALLER THAN D50	1.23E+03	7.36E+02	3.66E+02	1.93E+02	8.43E+01	4.44E+01	
CUM. (MG/DNCM) SMALLER THAN D50	2.03E+03	1.21E+03	6.01E+02	3.17E+02	1.38E+02	7.28E+01	
CUM. (GR/ACF) SMALLER THAN D50	5.39E-01	3.22E-01	1.60E-01	8.43E-02	3.69E-02	1.94E-02	
CUM. (GR/DNCF) SMALLER THAN D50	8.85E-01	5.28E-01	2.62E-01	1.38E-01	6.05E-02	3.18E-02	
GEO. MEAN DIA. (MICROMETERS)	4.67E+01	5.43E+00	3.28E+00	2.10E+00	1.22E+00	5.39E-01	2.28E-01
DM/DLOGD (MG/DNCM)	5.96E+02	3.24E+03	3.28E+03	1.39E+03	6.74E+02	1.47E+02	2.42E+02
DN/DLOGD (NO. PARTICLES/DNCM)	4.93E+06	1.70E+10	7.83E+10	1.27E+11	3.11E+11	7.89E+11	1.71E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.00	6.18	4.06	2.55	1.41	0.56	
GEO. MEAN DIA. (MICROMETERS)	7.05E+01	8.26E+00	5.00E+00	3.22E+00	1.90E+00	8.76E-01	3.63E-01
DM/DLOGD (MG/DNCM)	5.97E+02	3.26E+03	3.32E+03	1.41E+03	6.95E+02	1.57E+02	2.42E+02
DN/DLOGD (NO. PARTICLES/DNCM)	3.25E+06	1.11E+10	5.06E+10	8.10E+10	1.93E+11	4.48E+11	8.21E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.318	0.318
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-2 12-1-77 1737 - 1837 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 8

IMPACTOR FLOWRATE = 0.027 ACFM IMPACTOR TEMPERATURE = 310.0 F = 154.4 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 310.0 F = 154.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 24.72 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 11.07 CO = 0.00 N2 = 73.61 O2 = 7.38 H2O = 7.94

CALC. MASS LOADING = 7.5262E-01 GR/ACF 1.2356E+00 GR/DNCF 1.7222E+03 MG/ACM 2.8274E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.22	4.03	2.68	1.75	0.89	0.39	
MASS (MILLIGRAMS)	23.99	6.28	4.73	2.08	1.24	0.52	0.37
MG/DNCM/STAGE	1.73E+03	4.53E+02	3.41E+02	1.50E+02	8.94E+01	3.75E+01	2.67E+01
CUM. PERCENT OF MASS SMALLER THAN D50	38.82	22.80	10.74	5.43	2.27	0.94	
CUM. (MG/ACM) SMALLER THAN D50	6.69E+02	3.93E+02	1.85E+02	9.36E+01	3.91E+01	1.63E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.10E+03	6.45E+02	3.04E+02	1.54E+02	6.42E+01	2.67E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.92E-01	1.72E-01	8.08E-02	4.09E-02	1.71E-02	7.10E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.80E-01	2.82E-01	1.33E-01	6.71E-02	2.80E-02	1.17E-02	
GEO. MEAN DIA. (MICROMETERS)	4.65E+01	5.39E+00	3.29E+00	2.17E+00	1.25E+00	5.86E-01	2.73E-01
DM/DLOGD (MG/DNCM)	1.07E+03	1.79E+03	1.93E+03	8.12E+02	3.04E+02	1.03E+02	8.86E+01
DN/DLOGD (NO. PARTICLES/DNCM)	8.92E+06	9.59E+09	8.57E+10	6.72E+10	1.31E+11	4.31E+11	3.68E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.94	6.13	4.10	2.70	1.40	0.64	
GEO. MEAN DIA. (MICROMETERS)	7.03E+01	8.19E+00	5.01E+00	3.33E+00	1.94E+00	9.44E-01	4.50E-01
DM/DLOGD (MG/DNCM)	1.07E+03	1.80E+03	1.95E+03	8.26E+02	3.14E+02	1.10E+02	8.86E+01
DN/DLOGD (NO. PARTICLES/DNCM)	5.88E+06	6.26E+09	2.96E+10	4.29E+10	8.16E+10	2.49E+11	1.65E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI-3 12-2-77 1100 = 1130 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.029 ACFM IMPACTOR TEMPERATURE = 300.0 F = 148.9 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.4IN. OF HG STACK TEMPERATURE = 300.0 F = 148.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.99 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 10.25 CO = 0.00 N2 = 75.47 O2 = 8.39 H2O = 6.83

CALC. MASS LOADING = 7.7002E-01 GR/ACF 1.2240E+00 GR/DNCF 1.7621E+03 MG/ACM 2.8010E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.98	3.90	2.55	1.59	0.86	0.31	
MASS (MILLIGRAMS)	24.90	6.26	6.63	2.71	1.71	0.67	0.38
MG/DNCM/STAGE	1.61E+03	4.05E+02	4.29E+02	1.75E+02	1.11E+02	4.34E+01	2.46E+01
CUM. PERCENT OF MASS SMALLER THAN D50	42.44	27.97	12.64	6.38	2.43	0.88	
CUM. (MG/ACM) SMALLER THAN D50	7.48E+02	4.93E+02	2.23E+02	1.12E+02	4.28E+01	1.55E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.19E+03	7.83E+02	3.54E+02	1.79E+02	6.80E+01	2.46E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.27E-01	2.15E-01	9.74E-02	4.91E-02	1.87E-02	6.76E-03	
CUM. (GR/DNCF) SMALLER THAN D50	5.19E-01	3.42E-01	1.55E-01	7.81E-02	2.97E-02	1.08E-02	
GEO. MEAN DIA. (MICROMETERS)	4.58E+01	5.22E+00	3.15E+00	2.01E+00	1.17E+00	5.16E-01	2.18E+01
DM/DLOGD (MG/DNCM)	9.87E+02	1.60E+03	2.32E+03	8.57E+02	4.19E+02	9.70E+01	8.17E+01
DN/DLOGD (NO. PARTICLES/DNCM)	8.67E+06	9.51E+09	6.24E+10	8.85E+10	2.19E+11	5.93E+11	6.62E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.57	5.93	3.90	2.45	1.36	0.52	
GEO. MEAN DIA. (MICROMETERS)	6.91E+01	7.92E+00	4.81E+00	3.09E+00	1.82E+00	8.40E-01	3.47E+01
DM/DLOGD (MG/DNCM)	9.89E+02	1.62E+03	2.35E+03	8.72E+02	4.31E+02	1.04E+02	8.17E+01
DN/DLOGD (NO. PARTICLES/DNCM)	5.71E+06	6.21E+09	4.04E+10	5.64E+10	1.36E+11	3.35E+11	3.16E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3430	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-8 12-2-77 1510 = 1540 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 8

IMPACTOR FLOWRATE = 0.029 ACFM IMPACTOR TEMPERATURE = 300.0 F = 148.9 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.8IN. OF HG STACK TEMPERATURE = 300.0 F = 148.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.99 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 10.25 CO = 0.00 N2 = 75.47 O2 = 8.39 H2O = 6.83

CALC. MASS LOADING = 1.2732E+00 GR/ACF 2.0239E+00 GR/DNCF 2.9136E+03 MG/ACM 4.6314E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.94	3.87	2.57	1.68	0.85	0.37	
MASS (MILLIGRAMS)	49.38	10.33	6.59	3.03	1.41	0.47	0.32
MG/DNCM/STAGE	3.20E+03	6.69E+02	4.27E+02	1.96E+02	9.13E+01	3.04E+01	2.07E+01
CUM. PERCENT OF MASS SMALLER THAN D50	30.97	16.52	7.31	3.08	1.10	0.45	
CUM. (MG/ACM) SMALLER THAN D50	9.02E+02	4.81E+02	2.13E+02	8.96E+01	3.22E+01	1.30E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.43E+03	7.65E+02	3.39E+02	1.42E+02	5.12E+01	2.07E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.94E-01	2.10E-01	9.31E-02	3.92E-02	1.41E-02	5.70E-03	
CUM. (GR/DNCF) SMALLER THAN D50	6.27E-01	3.34E-01	1.48E-01	6.22E-02	2.24E-02	9.05E-03	
GEO. MEAN DIA. (MICROMETERS)	4.56E+01	5.18E+00	3.16E+00	2.08E+00	1.20E+00	5.61E-01	2.61E-01
DM/DLOGD (MG/DNCM)	1.95E+03	2.64E+03	2.41E+03	1.06E+03	3.10E+02	8.34E+01	6.88E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.73E+07	1.60E+10	6.45E+10	9.92E+10	1.52E+11	3.97E+11	3.27E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.51	5.89	3.94	2.59	1.34	0.61	
GEO. MEAN DIA. (MICROMETERS)	6.89E+01	7.87E+00	4.81E+00	3.19E+00	1.87E+00	9.05E-01	4.32E-01
DM/DLOGD (MG/DNCM)	1.96E+03	2.66E+03	2.44E+03	1.08E+03	3.20E+02	8.89E+01	6.88E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.14E+07	1.04E+10	4.17E+10	6.34E+10	9.41E+10	2.29E+11	1.63E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI-5 12-2-77 1702 - 1732 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.029 ACFM IMPACTOR TEMPERATURE = 300.0 F = 148.9 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.4IN. OF HG STACK TEMPERATURE = 300.0 F = 148.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.99 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 10.25 CO = 0.00 N2 = 75.47 O2 = 8.39 H2O = 6.83

CALC. MASS LOADING = 8.8918E-01 GR/ACF 1.4133E+00 GR/DNCF 2.0346E+03 MG/ACM 3.2341E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.98	3.90	2.55	1.59	0.86	0.31	
MASS (MILLIGRAMS)	25.63	10.14	8.11	3.71	1.59	0.48	0.20
MG/DNCM/STAGE	1.66E+03	6.57E+02	5.25E+02	2.40E+02	1.03E+02	3.11E+01	1.88E+01
CUM. PERCENT OF MASS SMALLER THAN D50	48.69	28.39	12.15	4.72	1.54	0.58	
CUM. (MG/ACM) SMALLER THAN D50	9.91E+02	5.78E+02	2.47E+02	9.61E+01	3.14E+01	1.18E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.57E+03	9.18E+02	3.93E+02	1.53E+02	4.99E+01	1.88E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.33E-01	2.52E-01	1.08E-01	4.20E-02	1.37E-02	5.16E-03	
CUM. (GR/DNCF) SMALLER THAN D50	6.88E-01	4.01E-01	1.72E-01	6.68E-02	2.18E-02	8.21E-03	
GEO. MEAN DIA. (MICROMETERS)	4.58E+01	9.22E+00	3.15E+00	2.01E+00	1.17E+00	5.16E-01	2.18E-01
DM/DLOGD (MG/DNCM)	1.02E+03	2.60E+03	2.84E+03	1.17E+03	3.89E+02	6.95E+01	6.24E+01
DN/DLOGD (NO. PARTICLES/DNCM)	8.93E+06	1.54E+10	7.64E+10	1.21E+11	2.03E+11	4.25E+11	5.05E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.57	5.93	3.90	2.45	1.34	0.52	
GEO. MEAN DIA. (MICROMETERS)	6.91E+01	7.92E+00	4.81E+00	3.09E+00	1.82E+00	8.60E-01	3.67E-01
DM/DLOGD (MG/DNCM)	1.02E+03	2.62E+03	2.87E+03	1.19E+03	4.01E+02	7.44E+01	6.24E+01
DN/DLOGD (NO. PARTICLES/DNCM)	5.88E+06	1.01E+10	4.94E+10	7.73E+10	1.28E+11	2.68E+11	2.61E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-6 12-5-77 1200 - 1230 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.024 ACFM IMPACTOR TEMPERATURE = 285.0 F = 140.6 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 285.0 F = 140.6 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.75 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.30 CO = 0.00 N2 = 74.83 O2 = 8.81 H2O = 7.06

CALC. MASS LOADING = 1.1646E+00 GR/ACF 1.8339E+00 GR/DNCF 2.6649E+03 MG/ACM 4.1988E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.65	4.28	2.80	1.75	0.96	0.35	
MASS (MILLIGRAMS)	38.88	4.97	5.63	2.31	1.44	0.36	0.89
MG/DNCM/STAGE	3.03E+03	3.87E+02	4.39E+02	1.80E+02	1.12E+02	2.80E+01	2.26E+01
CUM. PERCENT OF MASS SMALLER THAN D50	27.84	18.62	8.17	3.88	1.21	0.54	
CUM. (MG/ACM) SMALLER THAN D50	7.42E+02	4.96E+02	2.18E+02	1.03E+02	3.21E+01	1.43E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.17E+03	7.81E+02	3.43E+02	1.63E+02	5.06E+01	2.26E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.24E-01	2.17E-01	9.51E-02	4.52E-02	1.40E-02	6.27E-03	
CUM. (GR/DNCF) SMALLER THAN D50	5.11E-01	3.41E-01	1.50E-01	7.11E-02	2.21E-02	9.87E-03	
GEO. MEAN DIA. (MICROMETERS)	4.79E+01	5.72E+00	3.66E+00	2.21E+00	1.29E+00	5.77E-01	2.06E+01
DM/DLOGD (MG/DNCM)	1.90E+03	1.53E+03	2.38E+03	8.83E+02	6.28E+02	6.39E+01	7.50E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.46E+07	6.90E+09	4.83E+10	6.85E+10	1.66E+11	2.79E+11	6.22E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.58	6.50	4.27	2.69	1.58	0.58	
GEO. MEAN DIA. (MICROMETERS)	7.23E+01	8.68E+00	5.57E+00	3.39E+00	2.01E+00	9.31E-01	3.19E+01
DM/DLOGD (MG/DNCM)	1.90E+03	1.55E+03	2.41E+03	8.98E+02	6.40E+02	6.80E+01	7.98E+01
DN/DLOGD (NO. PARTICLES/DNCM)	9.60E+06	4.51E+09	3.13E+10	4.39E+10	1.04E+11	1.81E+11	2.08E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.310	0.310
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0580	0.0580

AVCI-7 12-5-77 1414 = 1444 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 8

IMPACTOR FLOWRATE = 0.024 ACFM IMPACTOR TEMPERATURE = 285.0 F = 140.6 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 285.0 F = 140.6 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.75 IN. OF HG MAX. PARTICLE DIAMETER = 100.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.30 CO = 0.00 N2 = 74.83 O2 = 8.83 H2O = 7.04

CALC. MASS LOADING = 2.0787E+00 GR/ACF 3.2735E+00 GR/DNCF 4.7569E+03 MG/ACM 7.4909E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.59	4.24	2.82	1.69	0.98	0.41	
MASS (MILLIGRAMS)	75.34	6.27	7.69	4.50	1.86	0.97	0.36
MG/DNCM/STAGE	5.84E+03	4.86E+02	5.96E+02	3.49E+02	1.44E+02	6.42E+01	2.71E+01
CUM. PERCENT OF MASS SMALLER THAN D50	21.99	15.50	7.54	2.88	0.95	0.36	
CUM. (MG/ACM) SMALLER THAN D50	1.05E+03	7.37E+02	3.59E+02	1.37E+02	4.53E+01	1.72E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.65E+03	1.16E+03	5.65E+02	2.16E+02	7.14E+01	2.71E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.57E-01	3.22E-01	1.57E-01	5.98E-02	1.98E-02	7.53E-03	
CUM. (GR/DNCF) SMALLER THAN D50	7.20E-01	5.07E-01	2.47E-01	9.42E-02	3.12E-02	1.19E-02	
GEO. MEAN DIA. (MICROMETERS)	4.77E+01	5.67E+00	3.46E+00	2.28E+00	1.32E+00	6.29E-01	2.92E-01
DM/DLOGD (MG/DNCM)	3.66E+03	1.92E+03	3.38E+03	1.98E+03	4.95E+02	1.23E+02	9.02E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.84E+07	8.88E+09	6.88E+10	1.34E+11	1.81E+11	4.26E+11	3.03E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.49	6.44	4.31	2.84	1.68	0.68	
GEO. MEAN DIA. (MICROMETERS)	7.21E+01	8.60E+00	5.27E+00	3.50E+00	2.05E+00	1.08E+00	6.79E+01
DM/DLOGD (MG/DNCM)	3.66E+03	1.94E+03	3.42E+03	1.93E+03	5.08E+02	1.31E+02	9.08E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.87E+07	5.81E+09	4.46E+10	8.68E+10	1.13E+11	2.49E+11	1.56E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI=0 12-6-77 1055 = 1125 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.33 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.45 CO = 0.00 N2 = 78.00 O2 = 7.56 H2O = 5.00

CALC. MASS LOADING = 1.9786E+00 GR/ACF 3.1446E+00 GR/DNCF 4.5186E+03 MG/ACM 7.1999E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.37	4.12	2.69	1.68	0.92	0.33	
MASS (MILLIGRAMS)	78.03	6.66	7.29	3.49	1.18	0.92	0.29
MG/DNCM/STAGE	5.65E+03	6.27E+02	5.28E+02	2.53E+02	8.54E+01	3.76E+01	1.81E+01
CUM. PERCENT OF MASS SMALLER THAN D50	21.51	12.80	5.47	1.96	0.77	0.25	
CUM. (MG/ACM) SMALLER THAN D50	9.72E+02	5.79E+02	2.47E+02	8.86E+01	3.50E+01	1.14E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.55E+03	9.21E+02	3.94E+02	1.41E+02	5.57E+01	1.81E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.25E-01	2.53E-01	1.08E-01	3.87E-02	1.53E-02	4.97E-03	
CUM. (GR/DNCF) SMALLER THAN D50	6.77E-01	4.03E-01	1.72E-01	6.17E-02	2.44E-02	7.91E-03	
GEO. MEAN DIA. (MICROMETERS)	4.70E+01	5.51E+00	3.33E+00	2.13E+00	1.24E+00	5.69E-01	2.33E-01
DM/DLOGD (MG/DNCM)	3.51E+03	2.48E+03	2.86E+03	1.24E+03	3.24E+02	8.47E+01	6.01E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.84E+07	1.25E+10	6.50E+10	1.08E+11	1.42E+11	4.38E+11	4.88E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.17	6.27	4.12	2.59	1.44	0.55	
GEO. MEAN DIA. (MICROMETERS)	7.10E+01	8.37E+00	5.08E+00	3.27E+00	1.93E+00	8.91E-01	3.98E-01
DM/DLOGD (MG/DNCM)	3.51E+03	2.50E+03	2.89E+03	1.26E+03	3.34E+02	9.05E+01	6.01E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.87E+07	8.15E+09	4.21E+10	6.89E+10	8.86E+10	2.45E+11	1.93E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-9 12-8-77 1311 - 1341 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER - 8

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.33 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.45 CO = 0.00 N2 = 78.00 O2 = 7.56 H2O = 5.46

CALC. MASS LOADING = 1.0805E+00 GR/ACF 1.7207E+00 GR/DNCF 2.4725E+03 MG/ACM 3.9374E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.33	4.09	2.72	1.76	0.91	0.39	
MASS (MILLIGRAMS)	37.31	5.25	6.40	3.17	1.41	0.43	0.83
MG/DNCM/STAGE	2.70E+03	3.80E+02	4.63E+02	2.29E+02	1.02E+02	3.11E+01	3.11E+01
CUM. PERCENT OF MASS SMALLER THAN D50	31.42	21.76	10.00	4.17	1.58	0.79	
CUM. (MG/ACM) SMALLER THAN D50	7.77E+02	5.38E+02	2.47E+02	1.03E+02	3.91E+01	1.95E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.24E+03	8.57E+02	3.94E+02	1.64E+02	6.23E+01	3.11E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.39E-01	2.35E-01	1.08E-01	4.51E-02	1.71E-02	8.54E-03	
CUM. (GR/DNCF) SMALLER THAN D50	5.41E-01	3.74E-01	1.72E-01	7.18E-02	2.72E-02	1.36E-02	
GEO. MEAN DIA. (MICROMETERS)	4.69E+01	5.47E+00	3.34E+00	2.20E+00	1.27E+00	5.97E-01	2.78E-01
DM/DLOGD (MG/DNCM)	1.68E+03	1.50E+03	2.62E+03	1.24E+03	3.68E+02	8.58E+01	1.03E+02
DN/DLOGD (NO. PARTICLES/DNCM)	1.37E+07	7.70E+09	5.93E+10	9.82E+10	1.43E+11	3.60E+11	4.85E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.10	6.22	4.16	2.74	1.42	0.65	
GEO. MEAN DIA. (MICROMETERS)	7.08E+01	8.31E+00	5.09E+00	3.38E+00	1.97E+00	9.68E-01	6.98E-01
DM/DLOGD (MG/DNCM)	1.68E+03	1.51E+03	2.65E+03	1.27E+03	3.58E+02	9.13E+01	1.83E+02
DN/DLOGD (NO. PARTICLES/DNCM)	9.01E+06	5.03E+09	3.84E+10	6.28E+10	8.90E+10	1.97E+11	2.65E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI=10 12-6-77 1500 = 1530 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.33 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.45 CO = 0.00 N2 = 78.00 O2 = 7.56 H2O = 5.46

CALC. MASS LOADING = 1.3770E+00 GR/ACF 2.1928E+00 GR/DNCF 3.1509E+03 MG/ACM 5.0179E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.39	4.13	2.70	1.69	0.92	0.33	
MASS (MILLIGRAMS)	48.26	7.41	7.38	3.68	1.70	0.33	0.30
MG/DNCM/STAGE	3.51E+03	5.38E+02	5.36E+02	2.67E+02	1.24E+02	2.40E+01	2.18E+01
CUM. PERCENT OF MASS SMALLER THAN D50	30.12	19.39	8.70	3.37	0.91	0.43	
CUM. (MG/ACM) SMALLER THAN D50	9.49E+02	6.11E+02	2.74E+02	1.06E+02	2.87E+01	1.37E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.51E+03	9.73E+02	4.37E+02	1.69E+02	4.58E+01	2.18E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.15E-01	2.67E-01	1.20E-01	4.65E-02	1.26E-02	5.98E-03	
CUM. (GR/DNCF) SMALLER THAN D50	6.60E-01	4.25E-01	1.91E-01	7.40E-02	2.00E-02	9.53E-03	
GEO. MEAN DIA. (MICROMETERS)	4.71E+01	5.52E+00	3.34E+00	2.13E+00	1.24E+00	5.51E-01	2.33E-01
DM/DLOGD (MG/DNCM)	2.18E+03	2.13E+03	2.90E+03	1.31E+03	4.68E+02	5.40E+01	9.24E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.76E+07	1.07E+10	6.57E+10	1.14E+11	2.05E+11	2.72E+11	4.79E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.19	6.28	4.13	2.60	1.44	0.55	
GEO. MEAN DIA. (MICROMETERS)	7.11E+01	8.38E+00	5.09E+00	3.27E+00	1.93E+00	8.93E-01	3.91E-01
DM/DLOGD (MG/DNCM)	2.18E+03	2.15E+03	2.94E+03	1.33E+03	4.82E+02	9.77E+01	7.24E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.16E+07	6.96E+09	4.25E+10	7.25E+10	1.27E+11	1.55E+11	2.31E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.310	0.310
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-13 12-7-77 1316 = 1346 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.93 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.47 CO = 0.00 N2 = 77.62 O2 = 7.57 H2O = 5.34

CALC. MASS LOADING = 7.8609E-01 GR/ACF 1.2243E+00 GR/DNCF 1.7989E+03 MG/ACM 2.8017E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.32	4.09	2.67	1.67	0.91	0.33	
MASS (MILLIGRAMS)	26.33	4.97	5.11	2.41	0.81	0.23	0.33
MG/DNCM/STAGE	1.84E+03	3.46E+02	3.56E+02	1.68E+02	5.65E+01	1.60E+01	2.30E+01
CUM. PERCENT OF MASS SMALLER THAN D50	34.49	22.12	9.41	3.81	1.39	0.82	
CUM. (MG/ACM) SMALLER THAN D50	6.20E+02	3.98E+02	1.69E+02	6.13E+01	2.51E+01	1.48E+01	
CUM. (MG/DNCM) SMALLER THAN D50	9.66E+02	6.20E+02	2.64E+02	9.55E+01	3.90E+01	2.30E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.71E-01	1.74E-01	7.39E-02	2.68E-02	1.10E-02	6.45E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.22E-01	2.71E-01	1.15E-01	4.17E-02	1.71E-02	1.01E-02	
GEO. MEAN DIA. (MICROMETERS)	4.69E+01	5.47E+00	3.31E+00	2.11E+00	1.23E+00	5.47E-01	2.38E+01
DM/DLOGD (MG/DNCM)	1.14E+03	1.37E+03	1.93E+03	8.22E+02	2.14E+02	3.62E+01	7.64E+01
DN/DLOGD (NO. PARTICLES/DNCM)	9.31E+06	7.05E+09	4.49E+10	7.33E+10	9.61E+10	1.86E+11	5.15E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.08	6.22	4.09	2.57	1.43	0.55	
GEO. MEAN DIA. (MICROMETERS)	7.08E+01	8.31E+00	5.04E+00	3.26E+00	1.92E+00	8.85E-01	3.68E+01
DM/DLOGD (MG/DNCM)	1.14E+03	1.38E+03	1.95E+03	8.37E+02	2.21E+02	3.86E+01	7.64E+01
DN/DLOGD (NO. PARTICLES/DNCM)	6.14E+06	4.61E+09	2.91E+10	4.68E+10	5.98E+10	1.06E+11	2.49E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-10 12-7-77 1550 = 1620 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 8

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.93 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.47 CO = 0.00 N2 = 77.62 O2 = 7.57 H2O = 5.34

CALC. MASS LOADING = 4.9898E-01 GR/ACF 7.7716E-01 GR/DNCF 1.1418E+03 MG/ACM 1.7784E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.32	4.08	2.72	1.78	0.91	0.39	
MASS (MILLIGRAMS)	13.85	5.84	4.31	1.73	0.86	0.31	0.32
MG/DNCM/STAGE	9.77E+02	2.71E+02	3.04E+02	1.22E+02	6.06E+01	2.19E+01	2.26E+01
CUM. PERCENT OF MASS SMALLER THAN D50	45.08	29.86	12.77	5.91	2.50	1.27	
CUM. (MG/ACM) SMALLER THAN D50	5.15E+02	3.41E+02	1.46E+02	6.75E+01	2.85E+01	1.45E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.02E+02	5.31E+02	2.27E+02	1.05E+02	4.44E+01	2.26E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.25E-01	1.49E-01	6.37E-02	2.95E-02	1.25E-02	6.33E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.50E-01	2.32E-01	9.92E-02	4.59E-02	1.94E-02	9.86E-03	
GEO. MEAN DIA. (MICROMETERS)	4.69E+01	5.47E+00	3.33E+00	2.20E+00	1.27E+00	5.98E-01	2.79E-01
DM/DLOGD (MG/DNCM)	6.06E+02	1.07E+03	1.72E+03	6.62E+02	2.07E+02	6.05E+01	7.80E+01
DN/DLOGD (NO. PARTICLES/DNCM)	4.95E+06	5.51E+09	3.91E+10	5.24E+10	8.52E+10	2.38E+11	2.91E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.08	6.21	4.15	2.74	1.42	0.65	
GEO. MEAN DIA. (MICROMETERS)	7.08E+01	8.30E+00	5.08E+00	3.37E+00	1.97E+00	9.60E-01	4.89E-01
DM/DLOGD (MG/DNCM)	6.06E+02	1.08E+03	1.74E+03	6.73E+02	2.13E+02	6.42E+01	7.50E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.27E+06	3.60E+09	2.53E+10	3.35E+10	5.31E+10	1.38E+11	1.48E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PST BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI-15 12-7-77 1730 = 1808 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = A

IMPACTOR FLOWRATE = 0.026 ACFM IMPACTOR TEMPERATURE = 295.0 F = 146.1 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.3IN. OF HG STACK TEMPERATURE = 295.0 F = 146.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.93 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 9.47 CO = 0.00 N2 = 77.62 O2 = 7.57 H2O = 5.34

CALC. MASS LOADING = 7.0473E-01 GR/ACF 1.0976E+00 GR/DNCF 1.6127E+03 MG/ACM 2.5117E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	7.32	4.09	2.67	1.67	0.91	0.33	
MASS (MILLIGRAMS)	23.70	4.02	4.75	1.94	0.95	0.27	0.60
MG/DNCM/STAGE	1.65E+03	2.80E+02	3.31E+02	1.35E+02	6.62E+01	1.88E+01	2.79E+01
CUM. PERCENT OF MASS SMALLER THAN D50	34.22	23.04	9.88	4.50	1.86	1.11	
CUM. (MG/ACM) SMALLER THAN D50	5.52E+02	3.72E+02	1.59E+02	7.25E+01	3.00E+01	1.79E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.60E+02	5.79E+02	2.48E+02	1.13E+02	4.67E+01	2.79E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.41E-01	1.63E-01	6.96E-02	3.17E-02	1.31E-02	7.82E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.76E-01	2.53E-01	1.08E-01	4.94E-02	2.04E-02	1.22E-02	
GEO. MEAN DIA. (MICROMETERS)	4.69E+01	5.47E+00	3.31E+00	2.11E+00	1.23E+00	5.47E-01	2.32E-01
DM/DLOGD (MG/DNCM)	1.02E+03	1.11E+03	1.79E+03	6.62E+02	2.51E+02	4.25E+01	9.26E-01
DN/DLOGD (NO. PARTICLES/DNCM)	8.38E+06	9.70E+09	4.17E+10	5.90E+10	1.13E+11	2.19E+11	6.24E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	11.08	6.22	4.09	2.57	1.43	0.55	
GEO. MEAN DIA. (MICROMETERS)	7.08E+01	8.31E+00	5.04E+00	3.24E+00	1.92E+00	8.85E-01	3.88E-01
DM/DLOGD (MG/DNCM)	1.03E+03	1.12E+03	1.81E+03	4.73E+02	2.59E+02	4.53E+01	9.86E-01
DN/DLOGD (NO. PARTICLES/DNCM)	5.53E+06	3.73E+09	2.70E+10	3.77E+10	7.01E+10	1.25E+11	3.02E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AvCI-16 12-8-77 1127 - 1157 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 8

IMPACTOR FLOWRATE = 0.030 ACFM IMPACTOR TEMPERATURE = 310.0 F = 154.4 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.4IN. OF HG STACK TEMPERATURE = 310.0 F = 154.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.76 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 7.51 CO = 0.00 N2 = 76.46 O2 = 9.85 H2O = 6.18

CALC. MASS LOADING = 9.6298E-01 GR/ACF 1.5525E+00 GR/DNCF 2.2036E+03 MG/ACM 3.5526E+03 MG/DNCM

	S0	S1	S2	S3	S4	S5	FILTER
IMPACTOR STAGE							
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.86	3.82	2.54	1.66	0.84	0.36	
MASS (MILLIGRAMS)	40.24	6.82	5.40	2.10	0.95	0.28	0.37
MG/DNCM/STAGE	2.55E+03	4.31E+02	3.42E+02	1.33E+02	6.01E+01	1.77E+01	2.34E+01
CUM. PERCENT OF MASS SMALLER THAN D50	28.35	16.28	6.59	2.85	1.14	0.66	
CUM. (MG/ACM) SMALLER THAN D50	6.25E+02	3.57E+02	1.45E+02	6.28E+01	2.55E+01	1.45E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.01E+03	5.76E+02	2.34E+02	1.01E+02	4.11E+01	2.34E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.73E-01	1.56E-01	6.34E-02	2.74E-02	1.11E-02	6.34E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.40E-01	2.52E-01	1.02E-01	4.42E-02	1.80E-02	1.02E-02	
GEO. MEAN DIA. (MICROMETERS)	8.54E+01	5.12E+00	3.12E+00	2.05E+00	1.18E+00	5.49E-01	2.94E-01
DM/DLOGD (MG/DNCM)	1.55E+03	1.70E+03	1.92E+03	7.17E+02	2.03E+02	4.80E+01	7.78E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.40E+07	1.06E+10	5.35E+10	6.97E+10	1.04E+11	2.44E+11	3.99E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.40	5.82	3.89	2.56	1.32	0.60	
GEO. MEAN DIA. (MICROMETERS)	6.86E+01	7.78E+00	4.76E+00	3.15E+00	1.84E+00	8.98E-01	4.23E-01
DM/DLOGD (MG/DNCM)	1.55E+03	1.71E+03	1.95E+03	7.30E+02	2.10E+02	5.14E+01	7.78E+01
DN/DLOGD (NO. PARTICLES/DNCM)	9.21E+06	6.95E+09	3.65E+10	4.66E+10	6.83E+10	1.39E+11	1.96E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.327	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

AVCI-17 12-8-77 1433 - 1503 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 4

IMPACTOR FLOWRATE = 0.030 ACFM IMPACTOR TEMPERATURE = 310.0 F = 154.4 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.0IN. OF HG STACK TEMPERATURE = 310.0 F = 154.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.76 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 7.51 CO = 0.00 N2 = 76.46 O2 = 9.85 H2O = 6.18

CALC. MASS LOADING = 7.1040E-01 GR/ACF 1.1653E+00 GR/DNCF 1.6256E+03 MG/ACM 2.6208E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.90	3.85	2.51	1.57	0.85	0.38	
MASS (MILLIGRAMS)	27.48	6.05	4.53	1.90	0.83	0.26	0.38
MG/DNCM/STAGE	1.74E+03	3.83E+02	2.87E+02	1.20E+02	5.25E+01	1.64E+01	2.40E+01
CUM. PERCENT OF MASS SMALLER THAN D50	33.67	19.07	8.13	3.55	1.54	0.92	
CUM. (MG/ACM) SMALLER THAN D50	5.47E+02	3.10E+02	1.32E+02	5.77E+01	2.51E+01	1.40E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.82E+02	5.00E+02	2.13E+02	9.30E+01	4.05E+01	2.40E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.39E-01	1.35E-01	5.78E-02	2.52E-02	1.10E-02	6.12E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.86E-01	2.18E-01	9.32E-02	4.06E-02	1.77E-02	1.05E-02	
GEO. MEAN DIA. (MICROMETERS)	4.55E+01	5.16E+00	3.11E+00	1.98E+00	1.15E+00	5.05E-01	2.12E+01
DM/DLOGD (MG/DNCM)	1.06E+03	1.51E+03	1.55E+03	5.65E+02	1.98E+02	3.64E+01	7.99E+01
DN/DLOGD (NO. PARTICLES/DNCM)	9.48E+06	9.28E+09	4.32E+10	6.89E+10	1.08E+11	2.36E+11	7.05E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.46	5.87	3.89	2.42	1.34	0.51	
GEO. MEAN DIA. (MICROMETERS)	6.88E+01	7.83E+00	4.75E+00	3.05E+00	1.80E+00	8.25E-01	3.50E+01
DM/DLOGD (MG/DNCM)	1.06E+03	1.52E+03	1.57E+03	5.96E+02	2.04E+02	3.91E+01	7.99E+01
DN/DLOGD (NO. PARTICLES/DNCM)	6.25E+06	6.06E+09	2.79E+10	4.00E+10	6.68E+10	1.33E+11	3.29E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.380	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3630	0.2484	0.1722	0.1353	0.0925	0.0560	0.0560

AVCI-1A 12-8-77 1600 - 1630 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER - 8

IMPACTOR FLOWRATE = 0.030 ACFM IMPACTOR TEMPERATURE = 310.0 F = 154.4 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.8IN. OF HG STACK TEMPERATURE = 310.0 F = 154.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.76 IN. OF HG MAX. PARTICLE DIAMETER = 300.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 7.51 CO = 0.00 N2 = 76.46 O2 = 9.85 H2O = 6.18

CALC. MASS LOADING = 7.2155E-01 GR/ACF 1.1633E+00 GR/DNCF 1.6512E+03 MG/ACM 2.6619E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	6.86	3.82	2.54	1.66	0.84	0.36	
MASS (MILLIGRAMS)	30.24	3.89	4.72	1.83	0.76	0.29	0.35
MG/DNCM/STAGE	1.91E+03	2.46E+02	2.99E+02	1.16E+02	4.81E+01	1.85E+01	2.21E+01
CUM. PERCENT OF MASS SMALLER THAN D50	28.14	18.89	7.68	3.33	1.52	0.83	
CUM. (MG/ACM) SMALLER THAN D50	4.65E+02	3.12E+02	1.27E+02	5.49E+01	2.51E+01	1.37E+01	
CUM. (MG/DNCM) SMALLER THAN D50	7.49E+02	5.03E+02	2.04E+02	8.86E+01	4.05E+01	2.21E+01	
CUM. (GR/ACF) SMALLER THAN D50	2.03E-01	1.36E-01	5.54E-02	2.40E-02	1.10E-02	6.00E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.27E-01	2.20E-01	8.93E-02	3.87E-02	1.77E-02	9.68E-03	
GEO. MEAN DIA. (MICROMETERS)	4.54E+01	5.12E+00	3.12E+00	2.05E+00	1.18E+00	5.49E-01	2.54E-01
DM/DLOGD (MG/DNCM)	1.17E+03	9.70E+02	1.68E+03	6.29E+02	1.63E+02	4.97E+01	7.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.05E+07	6.07E+09	4.67E+10	6.07E+10	8.33E+10	2.53E+11	3.78E+12

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.40	5.82	3.89	2.56	1.32	0.60	
GEO. MEAN DIA. (MICROMETERS)	6.86E+01	7.78E+00	4.76E+00	3.15E+00	1.84E+00	8.90E-01	4.23E-01
DM/DLOGD (MG/DNCM)	1.17E+03	9.77E+02	1.70E+03	6.36E+02	1.68E+02	5.32E+01	7.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	6.92E+06	3.96E+09	3.02E+10	3.87E+10	5.15E+10	1.44E+11	1.85E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.362	0.353	0.357	0.353	0.353
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0547	0.0567

AVCO=1 11=30=77 1502 = 1702 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = B

IMPACTOR FLOWRATE = 0.636 ACFM IMPACTOR TEMPERATURE = 170.0 F = 76.7 C SAMPLING DURATION = 120.00 MIN

IMPACTOR PRESSURE DROP = 2.1IN. OF HG STACK TEMPERATURE = 170.0 F = 76.7 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 29.05 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.72 CO = 0.00 N2 = 73.97 O2 = 15.37 H2O = 3.94

CALC. MASS LOADING = 1.3209E-02 GR/ACF 1.6844E-02 GR/DNCF 3.0226E+01 MG/ACM 3.8545E+01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	7.10	7.04	3.19	1.28	0.66	0.39	0.14	
MASS (MILLIGRAMS)	33.73	13.38	13.40	3.22	0.97	0.31	0.16	0.15
MG/DSCM/STAGE	1.99E+01	7.90E+00	7.91E+00	1.90E+00	5.74E-01	1.85E-01	9.74E-02	8.76E-02
CUM. PERCENT OF MASS SMALLER THAN D50	48.37	27.89	7.38	2.45	0.96	0.48	0.23	
CUM. (MG/ACM) SMALLER THAN D50	1.46E+01	8.43E+00	2.23E+00	7.41E-01	2.90E-01	1.45E-01	6.87E-02	
CUM. (MG/DNCM) SMALLER THAN D50	1.86E+01	1.07E+01	2.84E+00	9.44E-01	3.70E-01	1.85E-01	8.76E-02	
CUM. (GR/ACF) SMALLER THAN D50	6.39E-03	3.68E-03	9.74E-04	3.24E-04	1.27E-04	6.34E-05	3.00E-05	
CUM. (GR/DNCF) SMALLER THAN D50	8.19E-03	4.70E-03	1.24E-03	4.13E-04	1.62E-04	8.08E-05	3.83E-05	
GEO. MEAN DIA. (MICROMETERS)	1.88E+01	7.07E+00	4.74E+00	2.02E+00	9.17E-01	5.07E-01	2.30E-01	9.57E-02
DM/DLOGD (MG/DNCM)	2.35E+01	2.22E+01	2.30E+01	4.78E+00	2.00E+00	8.18E-01	2.11E-01	2.91E-01
DN/DLOGD (NO. PARTICLES/DNCM)	2.95E+06	5.30E+09	1.82E+08	4.90E+08	2.18E+09	5.27E+09	1.46E+10	2.79E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.74	10.66	4.85	1.97	1.04	0.64	0.25	
GEO. MEAN DIA. (MICROMETERS)	2.84E+01	1.07E+01	7.19E+00	3.09E+00	1.43E+00	8.12E-01	3.95E-01	1.74E-01
DM/DLOGD (MG/DNCM)	2.35E+01	2.23E+01	2.31E+01	4.85E+00	2.06E+00	8.71E-01	2.36E-01	2.91E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.95E+06	3.48E+09	1.19E+08	3.14E+08	1.35E+09	3.11E+09	7.29E+09	1.06E+11

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321	0.389	0.354	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495	0.0330	0.0229	

AVCO-1 11-30-77 1502 - 1702 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = D

IMPACTOR FLOWRATE = 0.636 ACFM IMPACTOR TEMPERATURE = 170.0 F = 76.7 C SAMPLING DURATION = 120.00 MIN

IMPACTOR PRESSURE DROP = 2.1IN. OF HG STACK TEMPERATURE = 170.0 F = 76.7 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 29.05 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.72 CO = 0.00 N2 = 73.97 O2 = 15.37 H2O = 3.94

CALC. MASS LOADING = 1.3209E-02 GR/ACF 1.6844E-02 GR/DNCF 3.0226E+01 MG/ACM 3.8545E+01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	7.10	7.04	3.19	1.28	0.66	0.39	0.14	
MASS (MILLIGRAMS)	33.73	13.38	13.60	3.22	0.97	0.31	0.16	0.15
MG/DSCM/STAGE	1.99E+01	7.90E+00	7.91E+00	1.90E+00	5.74E-01	1.85E-01	9.74E-02	8.76E-02
CUM. PERCENT OF MASS SMALLER THAN D50	48.37	27.89	7.38	2.45	0.96	0.48	0.23	
CUM. (MG/ACM) SMALLER THAN D50	1.46E+01	8.43E+00	2.23E+00	7.41E-01	2.90E-01	1.45E-01	6.87E-02	
CUM. (MG/DNCM) SMALLER THAN D50	1.86E+01	1.07E+01	2.84E+00	9.44E-01	3.70E-01	1.85E-01	8.76E-02	
CUM. (GR/ACF) SMALLER THAN D50	6.39E-03	3.68E-03	9.74E-04	3.24E-04	1.27E-04	6.34E-05	3.00E-05	
CUM. (GR/DNCF) SMALLER THAN D50	8.15E-03	4.70E-03	1.24E-03	4.13E-04	1.62E-04	8.08E-05	3.83E-05	
GEO. MEAN DIA. (MICROMETERS)	1.88E+01	7.07E+00	4.74E+00	2.02E+00	9.17E-01	5.07E-01	2.30E-01	9.57E-02
DM/DLOGD (MG/DNCM)	2.35E+01	2.22E+03	2.30E+01	4.78E+00	2.00E+00	8.18E-01	2.11E-01	2.91E-01
DN/DLOGD (NO. PARTICLES/DNCM)	2.95E+06	5.30E+09	1.82E+08	4.90E+08	2.18E+09	5.27E+09	1.46E+10	2.79E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.74	10.66	4.85	1.97	1.04	0.64	0.25	
GEO. MEAN DIA. (MICROMETERS)	2.84E+01	1.07E+01	7.19E+00	3.09E+00	1.43E+00	8.12E-01	3.95E-01	1.74E-01
DM/DLOGD (MG/DNCM)	2.35E+01	2.23E+03	2.31E+01	4.85E+00	2.06E+00	8.71E-01	2.36E-01	2.91E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.95E+06	3.48E+09	1.19E+08	3.14E+08	1.35E+09	3.11E+09	7.29E+09	1.06E+11

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321	0.389	0.354	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495	0.0330	0.0229	

AVCO-2 12-01-77 1502 - 1800 OUTLET SAMPLE U. OF M. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.615 ACFM IMPACTOR TEMPERATURE = 170.0 F = 76.7 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 2.0IN. OF HG STACK TEMPERATURE = 170.0 F = 76.7 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.52 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.70 CO = 0.00 N2 = 76.08 O2 = 12.92 H2O = 8.30

CALC. MASS LOADING = 8.9610E-03 GR/ACF 1.1683E-02 GR/DNCF 2.0506E+01 MG/ACM 2.6735E+01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	7.20	7.19	3.21	1.12	0.70	0.38	0.16	
MASS (MILLIGRAMS)	25.47	14.28	17.09	5.10	1.27	0.57	0.27	0.21
MG/DSCM/STAGE	1.06E+01	5.94E+00	7.11E+00	2.12E+00	5.29E-01	2.38E-01	1.12E-01	8.93E-02
CUM. PERCENT OF MASS SMALLER THAN D50	66.37	38.15	11.56	3.62	1.64	0.75	0.33	
CUM. (MG/ACM) SMALLER THAN D50	1.24E+01	7.82E+00	2.37E+00	7.42E-01	3.37E-01	1.54E-01	6.85E-02	
CUM. (MG/DNCM) SMALLER THAN D50	1.61E+01	1.02E+01	3.09E+00	9.66E-01	4.39E-01	2.01E-01	8.93E-02	
CUM. (GR/ACF) SMALLER THAN D50	5.41E-03	3.42E-03	1.04E-03	3.24E-04	1.47E-04	6.74E-05	2.99E-05	
CUM. (GR/DNCF) SMALLER THAN D50	7.05E-03	4.46E-03	1.35E-03	4.23E-04	1.92E-04	8.78E-05	3.90E-05	
GED. MEAN DIA. (MICROMETERS)	1.90E+01	7.19E+00	4.80E+00	1.90E+00	8.86E-01	5.19E-01	2.46E-01	1.12E-01
DM/DLOGD (MG/DNCM)	1.26E+01	8.71E+03	2.03E+01	4.64E+00	2.60E+00	9.09E-01	2.89E-01	2.97E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.55E+06	1.97E+10	1.54E+08	5.73E+08	3.15E+09	5.47E+09	1.63E+10	1.80E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.90	10.88	4.89	1.73	1.10	0.63	0.28	
GED. MEAN DIA. (MICROMETERS)	2.87E+01	1.09E+01	7.29E+00	2.91E+00	1.38E+00	8.31E-01	4.20E-01	1.99E-01
DM/DLOGD (MG/DNCM)	1.26E+01	8.76E+03	2.04E+01	4.72E+00	2.69E+00	9.67E-01	3.23E-01	2.97E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.02E+06	1.30E+10	1.01E+08	3.65E+08	1.94E+09	3.22E+09	8.32E+09	7.16E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.349	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0245	

AVCO-2 12-01-77 1502 - 1800 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.615 ACFM IMPACTOR TEMPERATURE = 170.0 F = 76.7 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 2.0IN. OF HG STACK TEMPERATURE = 170.0 F = 76.7 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.52 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.70 CO = 0.00 N2 = 76.88 O2 = 12.92 H2O = 3.50

CALC. MASS LOADING = 8.9610E-03 GR/ACF 1.1683E-02 GR/DNCF 2.0506E+01 MG/ACM 2.6739E+01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	7.20	7.19	3.21	1.12	0.70	0.38	0.16	
MASS (MILLIGRAMS)	25.47	14.28	17.09	5.10	1.27	0.57	0.27	0.21
MG/DSCM/STAGE	1.06E+01	5.94E+00	7.11E+00	2.12E+00	5.29E-01	2.38E-01	1.12E-01	8.93E-02
CUM. PERCENT OF MASS SMALLER THAN D50	60.37	38.15	11.56	3.62	1.64	0.75	0.33	
CUM. (MG/ACM) SMALLER THAN D50	1.24E+01	7.82E+00	2.37E+00	7.42E-01	3.37E-01	1.54E-01	6.85E-02	
CUM. (MG/DNCM) SMALLER THAN D50	1.61E+01	1.02E+01	3.09E+00	9.68E-01	4.39E-01	2.01E-01	8.93E-02	
CUM. (GR/ACF) SMALLER THAN D50	5.41E-03	3.42E-03	1.04E-03	3.24E-04	1.47E-04	6.74E-05	2.99E-05	
CUM. (GR/DNCF) SMALLER THAN D50	7.05E-03	4.46E-03	1.35E-03	4.23E-04	1.92E-04	8.78E-05	3.90E-05	
GEO. MEAN DIA. (MICROMETERS)	1.90E+01	7.19E+00	4.80E+00	1.90E+00	8.86E-01	5.19E-01	2.66E-01	1.12E-01
DM/DLOGD (MG/DNCM)	1.26E+01	8.71E+03	2.03E+01	4.64E+00	2.60E+00	9.89E-01	2.89E-01	2.97E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.55E+06	1.97E+10	1.54E+08	5.73E+08	3.15E+09	5.47E+09	1.63E+10	1.88E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.90	10.88	4.89	1.73	1.10	0.63	0.28	
GEO. MEAN DIA. (MICROMETERS)	2.87E+01	1.09E+01	7.29E+00	2.91E+00	1.38E+00	8.31E-01	4.20E-01	1.99E-01
DM/DLOGD (MG/DNCM)	1.26E+01	8.76E+03	2.08E+01	4.72E+00	2.69E+00	9.67E-01	3.23E-01	2.97E-01
DN/DLOGD (NO. PARTICLES/DNCM)	1.02E+06	1.30E+10	1.01E+08	3.65E+08	1.98E+09	3.22E+09	8.32E+09	7.16E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.148	0.330	0.371	0.271	0.308	0.373	0.369
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0208

AVCO-4 12-02-77 1111 - 1436 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.610 ACFM IMPACTOR TEMPERATURE = 160.0 F = 71.1 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 3.5IN. .25 HG STACK TEMPERATURE = 160.0 F = 71.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.91 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 7.68 CO = 0.00 N2 = 75.82 O2 = 10.46 H2O = 6.08

CALC. MASS LOADING = 1.7076E-03 GR/ACF 2.1551E-03 GR/DNCF 3.9076E+00 MG/ACM 4.9317E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.22	6.21	2.77	0.96	0.60	0.31	0.18	
MASS (MILLIGRAMS)	9.67	2.55	2.20	0.85	0.31	0.19	0.13	0.23
MG/DSCM/STAGE	2.95E+00	7.81E-01	6.74E-01	2.59E-01	9.57E-02	5.80E-02	4.02E-02	7.16E-02
CUM. PERCENT OF MASS SMALLER THAN D50	40.09	24.25	10.59	5.34	3.46	2.26	1.65	
CUM. (MG/ACM) SMALLER THAN D50	1.57E+00	9.48E-01	4.14E-01	2.09E-01	1.34E-01	8.86E-02	5.66E-02	
CUM. (MG/DNCM) SMALLER THAN D50	1.98E+00	1.20E+00	5.22E-01	2.63E-01	1.70E-01	1.12E-01	7.16E-02	
CUM. (GR/ACF) SMALLER THAN D50	6.85E-04	4.14E-04	1.81E-04	9.12E-05	5.87E-05	3.86E-05	2.47E-05	
CUM. (GR/DNCF) SMALLER THAN D50	8.64E-04	5.23E-04	2.28E-04	1.15E-04	7.41E-05	4.88E-05	3.12E-05	
GEO. MEAN DIA. (MICROMETERS)	1.76E+01	6.22E+00	4.15E+00	1.63E+00	7.58E-01	4.33E-01	1.93E-01	8.63E-02
DM/DLOGD (MG/DNCM)	3.26E+00	1.14E+03	1.92E+00	5.63E-01	4.54E-01	2.87E+01	9.55E+02	2.37E+01
DN/DLOGD (NO. PARTICLES/DNCM)	5.00E+05	4.00E+09	2.26E+07	1.09E+08	8.79E+08	2.15E+09	1.11E+10	3.33E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	9.42	9.41	4.22	1.49	0.94	0.52	0.22	
GEO. MEAN DIA. (MICROMETERS)	2.66E+01	9.42E+00	6.30E+00	2.51E+00	1.19E+00	7.01E-01	3.39E-01	1.96E-01
DM/DLOGD (MG/DNCM)	3.27E+00	1.15E+03	1.94E+00	5.73E-01	4.72E-01	2.94E-01	1.08E-01	2.37E-01
DN/DLOGD (NO. PARTICLES/DNCM)	3.30E+05	2.63E+09	1.48E+07	6.93E+07	5.39E+08	1.26E+09	6.51E+09	1.19E+11

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.388	0.373	0.309
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0209

AVCO-6 12-02-77 1550 - 1850 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = 0

IMPACTOR FLOWRATE = 0.814 ACFM IMPACTOR TEMPERATURE = 160.0 F = 71.1 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 3.6IN. OF HG STACK TEMPERATURE = 160.0 F = 71.1 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.91 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 7.68 CO = 0.00 N2 = 75.82 O2 = 12.48 H2O = 4.02

CALC. MASS LOADING = 1.9453E-03 GR/ACF 2.4551E-03 GR/DNCF 4.4514E+00 MG/ACM 5.6180E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.21	6.16	2.78	1.11	0.57	0.32	0.10	
MASS (MILLIGRAMS)	10.13	2.82	3.42	1.02	0.45	0.26	0.15	0.22
MG/DSCM/STAGE	3.08E+00	8.57E-01	1.04E+00	3.11E-01	1.38E-01	7.99E-02	4.66E-02	6.66E-02
CUM. PERCENT OF MASS SMALLER THAN D50	45.14	29.88	11.38	5.85	3.40	1.96	1.19	
CUM. (MG/ACM) SMALLER THAN D50	2.01E+00	1.33E+00	5.07E-01	2.60E-01	1.51E-01	8.80E-02	5.28E-02	
CUM. (MG/DNCM) SMALLER THAN D50	2.54E+00	1.68E+00	6.40E-01	3.29E-01	1.91E-01	1.11E-01	6.66E-02	
CUM. (GR/ACF) SMALLER THAN D50	8.78E-04	5.81E-04	2.21E-04	1.14E-04	6.61E-05	3.84E-05	2.31E-05	
CUM. (GR/DNCF) SMALLER THAN D50	1.11E-03	7.34E-04	2.79E-04	1.44E-04	8.35E-05	4.85E-05	2.91E-05	
GEO. MEAN DIA. (MICROMETERS)	1.76E+01	6.18E+00	4.14E+00	1.76E+00	7.92E-01	4.28E-01	1.83E-01	7.28E-02
DM/DLOGD (MG/DNCM)	3.40E+00	2.41E+02	3.01E+00	7.79E-01	4.71E-01	3.30E-01	8.91E-02	2.21E-01
DN/DLOGD (NO. PARTICLES/DNCM)	5.23E+05	8.58E+08	3.58E+07	1.21E+08	7.97E+08	3.53E+09	1.83E+10	6.83E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	9.40	9.32	4.24	1.72	0.90	0.50	0.19	
GEO. MEAN DIA. (MICROMETERS)	2.66E+01	9.36E+00	6.29E+00	2.70E+00	1.24E+00	6.93E-01	3.22E-01	1.37E-01
DM/DLOGD (MG/DNCM)	3.41E+00	2.42E+02	3.03E+00	7.92E-01	4.89E-01	3.56E-01	1.01E-01	2.21E-01
DN/DLOGD (NO. PARTICLES/DNCM)	3.46E+05	5.64E+08	2.33E+07	7.71E+07	4.88E+08	2.04E+09	9.79E+09	1.66E+11

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321	0.389	0.350	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5793	0.2512	0.0793	0.0495	0.0330	0.0229	

AVCO-7 12-05-77 1256 - 1548 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.707 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 2.6IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.67 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.70 CO = 0.00 N2 = 79.60 O2 = 13.40 H2O = 0.30

CALC. MASS LOADING = 1.7895E-03 GR/ACF 2.3025E-03 GR/DNCF 4.0958E+00 MG/ACM 5.2689E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.69	6.68	2.98	1.04	0.65	0.35	0.14	
MASS (MILLIGRAMS)	7.65	2.70	3.10	0.82	0.19	0.06	0.09	0.18
MG/DSCM/STAGE	2.73E+00	9.65E-01	1.11E+00	2.91E-01	6.86E-02	2.23E-02	1.98E-02	6.28E-02
CUM. PERCENT OF MASS SMALLER THAN D50	48.17	29.85	8.81	3.29	1.98	1.56	1.19	
CUM. (MG/ACM) SMALLER THAN D50	1.97E+00	1.22E+00	3.61E-01	1.35E-01	8.13E-02	6.39E-02	4.88E-02	
CUM. (MG/DNCM) SMALLER THAN D50	2.54E+00	1.57E+00	4.64E-01	1.73E-01	1.05E-01	8.23E-02	6.28E-02	
CUM. (GR/ACF) SMALLER THAN D50	8.62E-04	5.34E-04	1.58E-04	5.88E-05	3.55E-05	2.79E-05	2.13E-05	
CUM. (GR/DNCF) SMALLER THAN D50	1.11E-03	6.87E-04	2.03E-04	7.56E-05	4.57E-05	3.59E-05	2.75E-05	
GEO. MEAN DIA. (MICROMETERS)	1.83E+01	6.69E+00	4.46E+00	1.76E+00	8.19E-01	4.76E-01	2.19E-01	9.79E-02
DM/DLOGD (MG/DNCM)	3.13E+00	1.41E+03	3.16E+00	6.35E-01	3.35E-01	8.25E-02	4.84E-02	2.09E-01
DN/DLOGD (NO. PARTICLES/DNCM)	4.30E+05	3.98E+09	2.99E+07	9.84E+07	5.13E+08	6.91E+08	3.86E+09	1.89E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.13	10.12	4.54	1.61	1.02	0.57	0.29	
GEO. MEAN DIA. (MICROMETERS)	2.76E+01	1.01E+01	6.78E+00	2.70E+00	1.28E+00	7.63E-01	3.78E-01	1.77E-01
DM/DLOGD (MG/DNCM)	3.13E+00	1.42E+03	3.18E+00	6.46E-01	3.47E-01	8.63E-02	5.63E-02	2.09E-01
DN/DLOGD (NO. PARTICLES/DNCM)	2.84E+05	2.62E+09	1.96E+07	6.26E+07	3.15E+08	3.79E+08	1.92E+09	7.17E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.369
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.9768	0.2501	0.0808	0.0524	0.0333	0.0249

AVCO-7 12-05-77 1256 - 1548 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.707 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 180.00 MIN

IMPACTOR PRESSURE DROP = 2.6IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.67 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.70 CO = 0.00 N2 = 75.60 O2 = 13.40 H2O = 4.30

CALC. MASS LOADING = 1.7895E-03 GR/ACF 2.3025E-03 GR/DNCF 4.0950E+00 MG/ACM 5.2669E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.69	6.68	2.98	1.04	0.65	0.35	0.14	
MASS (MILLIGRAMS)	7.65	2.70	3.10	0.82	0.19	0.06	0.05	0.18
MG/DSCM/STAGE	2.73E+00	9.65E-01	1.11E+00	2.91E-01	6.86E-02	2.23E-02	1.94E-02	6.28E-02
CUM. PERCENT OF MASS SMALLER THAN D50	48.17	20.85	8.81	3.29	1.98	1.56	1.19	
CUM. (MG/ACM) SMALLER THAN D50	1.97E+00	1.22E+00	3.61E-01	1.35E-01	8.13E-02	6.39E-02	4.88E-02	
CUM. (MG/DNCM) SMALLER THAN D50	2.54E+00	1.57E+00	4.64E-01	1.73E-01	1.05E-01	8.23E-02	6.28E-02	
CUM. (GR/ACF) SMALLER THAN D50	8.62E-04	5.34E-04	1.58E-04	5.88E-05	3.55E-05	2.79E-05	2.13E-05	
CUM. (GR/DNCF) SMALLER THAN D50	1.11E-03	6.87E-04	2.03E-04	7.56E-05	4.57E-05	3.59E-05	2.75E-05	
GEO. MEAN DIA. (MICROMETERS)	1.83E+01	6.69E+00	4.46E+00	1.76E+00	8.19E-01	4.74E-01	2.19E-01	9.79E-02
DM/DLOGD (MG/DNCM)	3.13E+00	1.41E+03	3.16E+00	6.35E-01	3.39E-01	8.25E-02	6.84E-02	2.09E-01
DN/DLOGD (NO. PARTICLES/DNCM)	4.30E+05	3.98E+09	2.99E+07	9.84E+07	5.13E+08	6.51E+08	3.88E+09	1.89E+11

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.13	10.12	4.54	1.61	1.02	0.57	0.25	
GEO. MEAN DIA. (MICROMETERS)	2.76E+01	1.01E+01	6.78E+00	2.70E+00	1.28E+00	7.63E-01	3.78E-01	1.77E-01
DM/DLOGD (MG/DNCM)	3.13E+00	1.42E+03	3.18E+00	6.46E-01	3.47E-01	8.83E-02	5.43E-02	2.09E-01
DN/DLOGD (NO. PARTICLES/DNCM)	2.84E+05	2.62E+09	1.96E+07	6.26E+07	3.15E+08	3.79E+08	1.92E+09	7.17E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.349
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0526	0.0333	0.0245

AVCO-9 12-06-77 1122 - 1822 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.696 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 420.00 MIN

IMPACTOR PRESSURE DROP = 2.5IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.28 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.69 CO = 0.00 N2 = 75.52 O2 = 13.38 H2O = 4.40

CALC. MASS LOADING = 8.7742E-04 GR/ACF 1.1457E-03 GR/DNCF 2.0078E+00 MG/ACM 2.6218E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.74	6.73	3.00	1.04	0.65	0.35	0.14	
MASS (MILLIGRAMS)	10.05	3.54	2.38	0.38	0.15	0.06	0.02	0.04
MG/DSCM/STAGE	1.59E+00	5.58E-01	3.76E-01	5.92E-02	2.37E-02	9.23E-03	2.60E-03	7.10E-03
CUM. PERCENT OF MASS SMALLER THAN D50	30.53	18.23	3.88	1.62	0.72	0.37	0.27	
CUM. (MG/ACM) SMALLER THAN D50	7.94E-01	3.66E-01	7.79E-02	3.26E-02	1.45E-02	7.43E-03	5.44E-03	
CUM. (MG/DNCM) SMALLER THAN D50	1.04E+00	4.78E-01	1.02E-01	4.26E-02	1.89E-02	9.70E-03	7.10E-03	
CUM. (GR/ACF) SMALLER THAN D50	3.47E-04	1.60E-04	3.41E-05	1.43E-05	6.34E-06	3.25E-06	2.38E-06	
CUM. (GR/DNCF) SMALLER THAN D50	4.53E-04	2.09E-04	4.45E-05	1.86E-05	8.27E-06	4.24E-06	3.10E-06	
GEO. MEAN DIA. (MICROMETERS)	1.84E+01	6.74E+00	4.50E+00	1.77E+00	8.25E-01	4.78E-01	2.81E-01	9.84E-02
DM/DLOGD (MG/DNCM)	1.82E+00	8.18E-02	1.07E+00	1.29E-01	1.16E-01	3.42E-02	6.49E-03	2.36E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.48E+05	2.25E+09	9.93E+06	1.95E+07	1.73E+08	2.64E+08	5.08E+08	2.08E+10

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.21	10.19	4.57	1.62	1.03	0.58	0.25	
GEO. MEAN DIA. (MICROMETERS)	2.77E+01	1.02E+01	6.83E+00	2.72E+00	1.29E+00	7.69E-01	3.81E-01	1.79E-01
DM/DLOGD (MG/DNCM)	1.83E+00	8.23E-02	1.08E+00	1.31E-01	1.20E-01	3.44E-02	7.88E-03	2.36E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.64E+05	1.48E+09	6.49E+06	1.24E+07	1.07E+08	1.58E+08	2.51E+08	7.89E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.140	0.330	0.371	0.271	0.388	0.373	0.369
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0249

AVCO-9 12-06-77 1122 - 1822 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.696 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 420.00 MIN

IMPACTOR PRESSURE DROP = 2.5IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.28 IN. OF HG MAX. PARTICLE DIAMETER = 90.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.69 CO = 0.00 N2 = 75.52 O2 = 13.38 H2O = 4.00

CALC. MASS LOADING = 8.7742E-04 GR/ACF 1.1457E-03 GR/DNCF 2.0078E+00 MG/ACM 2.6218E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	6.74	6.73	3.00	1.04	0.65	0.35	0.14	
MASS (MILLIGRAMS)	10.05	3.54	2.38	0.38	0.15	0.06	0.02	0.04
MG/DSCM/STAGE	1.59E+00	5.58E-01	3.76E-01	5.92E-02	2.37E-02	9.23E-03	2.60E-03	7.10E-03
CUM. PERCENT OF MASS SMALLER THAN D50	39.53	18.23	3.88	1.62	0.72	0.37	0.27	
CUM. (MG/ACM) SMALLER THAN D50	7.94E-01	3.66E-01	7.79E-02	3.26E-02	1.45E-02	7.43E-03	5.44E-03	
CUM. (MG/DNCM) SMALLER THAN D50	1.04E+00	4.78E-01	1.02E-01	4.26E-02	1.89E-02	9.70E-03	7.10E-03	
CUM. (GR/ACF) SMALLER THAN D50	3.47E-04	1.60E-04	3.41E-05	1.43E-05	6.34E-06	3.25E-06	2.38E-06	
CUM. (GR/DNCF) SMALLER THAN D50	4.53E-04	2.09E-04	4.45E-05	1.86E-05	8.27E-06	4.24E-06	3.10E-06	
GEO. MEAN DIA. (MICROMETERS)	1.84E+01	6.74E+00	4.50E+00	1.77E+00	8.25E-01	4.78E-01	2.21E-01	9.84E-02
DM/DLOGD (MG/DNCM)	1.82E+00	8.18E+02	1.07E+00	1.29E-01	1.16E-01	3.42E-02	6.49E-03	2.36E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.48E+05	2.25E+09	9.93E+06	1.95E+07	1.73E+08	2.64E+08	5.08E+08	2.08E+10

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	10.21	10.19	4.57	1.62	1.03	0.58	0.29	
GEO. MEAN DIA. (MICROMETERS)	2.77E+01	1.02E+01	6.83E+00	2.72E+00	1.29E+00	7.69E-01	3.81E-01	1.79E-01
DM/DLOGD (MG/DNCM)	1.83E+00	8.23E+02	1.08E+00	1.31E-01	1.20E-01	3.66E-02	7.28E-03	2.36E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.64E+05	1.48E+09	6.49E+06	1.24E+07	1.07E+08	1.54E+08	2.51E+08	7.89E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.148	0.330	0.371	0.271	0.308	0.373	0.549	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0205	

AVCO-11 12-07-77 1054 - 1756 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. - A

IMPACTOR FLOWRATE = 1.020 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 422.00 MIN

IMPACTOR PRESSURE DROP = 5.5IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.88 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.76 CO = 0.00 N2 = 76.31 O2 = 13.52 H2O = 3.40

CALC. MASS LOADING = 6.2794E-04 GR/ACF 7.9459E-04 GR/DNCF 1.4369E+00 MG/ACM 1.8183E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	5.57	5.56	2.47	0.85	0.52	0.26	0.09	
MASS (MILLIGRAMS)	11.46	3.88	1.74	0.28	0.06	0.02	0.01	0.07
MG/DSCM/STAGE	1.19E+00	4.03E-01	1.81E-01	2.88E-02	6.26E-03	2.03E-03	1.02E-03	6.77E-03
CUM. PERCENT OF MASS SMALLER THAN D50	34.57	12.42	2.67	0.88	0.54	0.43	0.37	
CUM. (MG/ACM) SMALLER THAN D50	4.97E-01	1.79E-01	3.54E-02	1.27E-02	7.76E-03	6.15E-03	5.35E-03	
CUM. (MG/DNCM) SMALLER THAN D50	6.29E-01	2.26E-01	4.48E-02	1.61E-02	9.81E-03	7.78E-03	6.77E-03	
CUM. (GR/ACF) SMALLER THAN D50	2.17E-04	7.80E-05	1.55E-05	5.55E-06	3.39E-06	2.69E-06	2.34E-06	
CUM. (GR/DNCF) SMALLER THAN D50	2.75E-04	9.87E-05	1.96E-05	7.03E-06	4.29E-06	3.40E-06	2.96E-06	
GEO. MEAN DIA. (MICROMETERS)	1.67E+01	5.56E+00	3.71E+00	1.45E+00	6.67E-01	3.68E-01	1.90E-01	6.19E-02
DM/DLOGD (MG/DNCM)	1.25E+00	5.89E+02	5.14E-01	6.21E-02	2.97E-02	6.63E-03	2.15E-03	2.29E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.26E+05	2.88E+09	8.50E+06	1.71E+07	8.42E+07	1.12E+08	5.35E+08	8.12E+10

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	8.44	8.42	3.77	1.33	0.83	0.44	0.17	
GEO. MEAN DIA. (MICROMETERS)	2.52E+01	8.43E+00	5.64E+00	2.24E+00	1.05E+00	6.05E-01	2.72E-01	1.19E-01
DM/DLOGD (MG/DNCM)	1.25E+00	5.92E+02	5.19E-01	6.34E-02	3.10E-02	7.28E-03	2.48E-03	2.25E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.49E+05	1.89E+09	5.54E+06	1.08E+07	5.10E+07	6.29E+07	2.32E+08	2.53E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.349	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0249	

AVCO-11 12-07-77 1054 - 1756 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 1.020 ACFM IMPACTOR TEMPERATURE = 165.0 F = 73.9 C SAMPLING DURATION = 422.00 MIN

IMPACTOR PRESSURE DROP = 5.5IN. OF HG STACK TEMPERATURE = 165.0 F = 73.9 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 28.88 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 6.76 CO = 0.00 N2 = 76.31 O2 = 13.52 H2O = 3.40

CALC. MASS LOADING = 6.2794E-04 GR/ACF 7.9459E-04 GR/DNCF 1.4369E+00 MG/ACM 1.8183E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	5.57	5.56	2.67	0.85	0.52	0.26	0.09	
MASS (MILLIGRAMS)	11.46	3.88	1.74	0.28	0.06	0.02	0.01	0.07
MG/DSCM/STAGE	1.19E+00	4.03E-01	1.81E-01	2.88E-02	6.26E-03	2.03E-03	1.02E-03	6.77E-03
CUM. PERCENT OF MASS SMALLER THAN D50	34.57	12.42	2.47	0.88	0.58	0.03	0.37	
CUM. (MG/ACM) SMALLER THAN D50	4.97E-01	1.79E-01	3.50E-02	1.27E-02	7.76E-03	6.15E-03	5.35E-03	
CUM. (MG/DNCM) SMALLER THAN D50	6.29E-01	2.26E-01	4.88E-02	1.61E-02	9.81E-03	7.78E-03	6.77E-03	
CUM. (GR/ACF) SMALLER THAN D50	2.17E-04	7.80E-05	1.55E-05	5.55E-06	3.39E-06	2.69E-06	2.34E-06	
CUM. (GR/DNCF) SMALLER THAN D50	2.75E-04	9.87E-05	1.96E-05	7.03E-06	4.29E-06	3.40E-06	2.96E-06	
GEO. MEAN DIA. (MICROMETERS)	1.67E+01	5.56E+00	3.71E+00	1.05E+00	6.67E-01	3.68E-01	1.50E-01	6.15E-02
DM/DLOGD (MG/DNCM)	1.25E+00	5.89E+02	5.14E-01	6.21E-02	2.97E-02	6.63E-03	2.19E-03	2.25E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.26E+05	2.88E+09	8.50E+06	1.71E+07	8.42E+07	1.12E+08	5.35E+08	8.12E+10

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	8.44	8.42	3.77	1.33	0.83	0.44	0.17	
GEO. MEAN DIA. (MICROMETERS)	2.52E+01	8.43E+00	5.64E+00	2.24E+00	1.05E+00	6.05E-01	2.72E-01	1.19E-01
DM/DLOGD (MG/DNCM)	1.25E+00	5.92E+02	5.19E-01	6.34E-02	3.10E-02	7.28E-03	2.45E-03	2.25E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.49E+05	1.89E+09	5.58E+06	1.08E+07	5.10E+07	6.29E+07	2.32E+08	2.53E+10

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.184	0.330	0.371	0.271	0.308	0.373	0.349
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0245

AVCO-13 12-08-77 1142 = 1808 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.315 ACFM IMPACTOR TEMPERATURE = 130.0 F = 54.4 C SAMPLING DURATION = 373.00 MIN

IMPACTOR PRESSURE DROP = 0.6IN. OF HG STACK TEMPERATURE = 130.0 F = 54.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 29.30 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 3.84 CO = 0.00 N2 = 76.78 O2 = 15.36 H2O = 4.02

CALC. MASS LOADING = 9.0484E-04 GR/ACF 1.0722E-03 GR/DNCF 2.0706E+00 MG/ACM 2.4536E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	9.91	9.89	4.44	1.58	1.01	0.58	0.27	
MASS (MILLIGRAMS)	6.50	1.04	1.06	0.19	0.03	0.01	0.00	0.06
MG/DSCM/STAGE	1.60E+00	3.70E-01	3.77E-01	6.73E-02	1.14E-02	4.04E-03	1.35E-03	2.02E-02
CUM. PERCENT OF MASS SMALLER THAN D50	34.71	19.62	8.25	1.51	1.04	0.88	0.82	
CUM. (MG/ACM) SMALLER THAN D50	7.19E-01	4.06E-01	8.80E-02	3.12E-02	2.16E-02	1.82E-02	1.70E-02	
CUM. (MG/DNCM) SMALLER THAN D50	8.52E-01	4.81E-01	1.04E-01	3.70E-02	2.56E-02	2.15E-02	2.02E-02	
CUM. (GR/ACF) SMALLER THAN D50	3.14E-04	1.77E-04	3.85E-05	1.37E-05	9.43E-06	7.94E-06	7.45E-06	
CUM. (GR/DNCF) SMALLER THAN D50	3.72E-04	2.10E-04	4.56E-05	1.62E-05	1.12E-05	9.41E-06	8.82E-06	
GEO. MEAN DIA. (MICROMETERS)	2.23E+01	9.90E+00	6.63E+00	2.65E+00	1.26E+00	7.64E-01	3.96E-01	1.91E-01
DM/DLOGD (MG/DNCM)	2.28E+00	5.46E-02	1.08E+00	1.50E-01	5.85E-02	1.70E-02	4.04E-03	6.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.74E+05	4.73E+08	3.13E+06	6.79E+06	2.47E+07	3.20E+07	5.49E+07	8.15E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	14.97	14.95	6.74	2.42	1.56	0.92	0.45	
GEO. MEAN DIA. (MICROMETERS)	3.36E+01	1.50E+01	1.00E+01	4.04E+00	1.94E+00	1.19E+00	6.81E-01	3.17E-01
DM/DLOGD (MG/DNCM)	2.28E+00	5.47E+02	1.09E+00	1.51E-01	5.98E-02	1.76E-02	4.33E-03	6.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.15E+05	3.12E+08	2.06E+06	4.39E+06	1.56E+07	1.97E+07	3.14E+07	4.03E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.349
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0245

AVCO-13 12-08-77 1142 - 1808 OUTLET SAMPLE U. OF W. MARK III SOURCE TEST IMPACTOR NO. = A

IMPACTOR FLOWRATE = 0.315 ACFM IMPACTOR TEMPERATURE = 130.0 F = 54.4 C SAMPLING DURATION = 373.00 MIN

IMPACTOR PRESSURE DROP = 0.6IN. OF HG STACK TEMPERATURE = 130.0 F = 54.4 C

ASSUMED PARTICLE DENSITY = 2.27 GM/CU.CM. STACK PRESSURE = 29.30 IN. OF HG MAX. PARTICLE DIAMETER = 50.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 3.84 CO = 0.00 N2 = 76.78 O2 = 15.36 H2O = 4.02

CALC. MASS LOADING = 9.0484E-04 GR/ACF 1.0722E-03 GR/DNCF 2.0706E+00 MG/ACM 2.4534E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	S6	S7	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7	8
D50 (MICROMETERS)	9.91	9.89	4.44	1.58	1.01	0.58	0.27	
MASS (MILLIGRAMS)	4.50	1.04	1.06	0.19	0.03	0.01	0.00	0.04
MG/DSCM/STAGE	1.60E+00	3.70E-01	3.77E-01	6.73E-02	1.14E-02	4.04E-03	1.35E-03	2.02E-02
CUM. PERCENT OF MASS SMALLER THAN D50	34.71	19.62	4.25	1.51	1.04	0.88	0.82	
CUM. (MG/ACM) SMALLER THAN D50	7.19E-01	4.06E-01	8.80E-02	3.12E-02	2.16E-02	1.82E-02	1.70E-02	
CUM. (MG/DNCM) SMALLER THAN D50	8.52E-01	4.81E-01	1.04E-01	3.70E-02	2.56E-02	2.15E-02	2.02E-02	
CUM. (GR/ACF) SMALLER THAN D50	3.14E-04	1.77E-04	3.85E-05	1.37E-05	9.43E-06	7.94E-06	7.45E-06	
CUM. (GR/DNCF) SMALLER THAN D50	3.72E-04	2.10E-04	4.56E-05	1.62E-05	1.12E-05	9.41E-06	8.82E-06	
GEO. MEAN DIA. (MICROMETERS)	2.23E+01	9.90E+00	6.63E+00	2.65E+00	1.26E+00	7.64E-01	3.96E-01	1.91E-01
DM/DLOGD (MG/DNCM)	2.28E+00	5.46E+02	1.08E+00	1.50E-01	5.85E-02	1.70E-02	4.04E-03	4.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.74E+05	4.73E+08	3.13E+06	6.79E+06	2.47E+07	3.20E+07	9.49E+07	8.15E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	18.97	14.95	6.74	2.62	1.56	0.92	0.45	
GEO. MEAN DIA. (MICROMETERS)	3.36E+01	1.50E+01	1.00E+01	4.04E+00	1.94E+00	1.19E+00	6.41E-01	3.17E-01
DM/DLOGD (MG/DNCM)	2.28E+00	5.47E+02	1.09E+00	1.51E-01	5.98E-02	1.76E-02	4.33E-03	4.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.15E+05	3.12E+08	2.06E+06	4.39E+06	1.56E+07	1.97E+07	5.14E+07	4.03E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	0.373	0.349
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	0.0333	0.0245

PART 2

CASCADE IMPACTOR RUN DATA

June, 1978 Test

API-1 BRINK 1040 6/13/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM, IMPACTOR TEMPERATURE = 45.0 F = 7.2 C SAMPLING DURATION = 30.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 45.0 F = 7.2 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.97 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.20 O2 = 19.80 H2O = 1.00

CALC. MASS LOADING = 4.6311E+00 GR/ACF 4.6049E+00 GR/DNCF 1.0598E+04 MG/ACM 1.0537E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	3.96	2.20	1.50	0.92	0.46	0.17	
MASS (MILLIGRAMS)	451.66	30.55	27.73	15.46	10.00	2.47	2.29
MG/DNCM/STAGE	8.81E+03	5.96E+02	5.41E+02	3.02E+02	1.95E+02	4.82E+01	4.47E+01
CUM. PERCENT OF MASS SMALLER THAN D50	16.38	10.73	5.59	2.73	0.88	0.42	
CUM. (MG/ACM) SMALLER THAN D50	1.74E+03	1.14E+03	5.93E+02	2.90E+02	9.34E+01	4.49E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.73E+03	1.13E+03	5.90E+02	2.88E+02	9.29E+01	4.47E+01	
CUM. (GR/ACF) SMALLER THAN D50	7.59E-01	4.97E-01	2.59E-01	1.27E-01	4.08E-02	1.96E-02	
CUM. (GR/DNCF) SMALLER THAN D50	7.54E-01	4.94E-01	2.58E-01	1.26E-01	4.06E-02	1.95E-02	
GEO. MEAN DIA. (MICROMETERS)	1.26E+01	2.95E+00	1.82E+00	1.17E+00	6.50E-01	2.82E-01	1.22E-01
DM/DLOGD (MG/DNCM)	8.77E+03	2.34E+03	3.22E+03	1.41E+03	6.56E+02	1.12E+02	1.48E+02
DN/DLOGD (NO. PARTICLES/DNCM)	3.21E+09	6.63E+10	3.91E+11	6.41E+11	1.74E+12	3.66E+12	5.99E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.45	3.41	2.47	1.53	0.79	0.32	
GEO. MEAN DIA. (MICROMETERS)	2.04E+01	4.83E+00	2.99E+00	1.98E+00	1.10E+00	5.08E-01	2.27E-01
DM/DLOGD (MG/DNCM)	8.80E+03	2.37E+03	3.27E+03	1.44E+03	6.84E+02	1.23E+02	1.48E+02
DN/DLOGD (NO. PARTICLES/DNCM)	1.97E+09	4.01E+10	2.34E+11	3.77E+11	9.83E+11	1.83E+12	2.41E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PST BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APII-2 BRINK 1040 6/13/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 50.0 F = 10.0 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 50.0 F = 10.0 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.97 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.20 O2 = 19.80 H2O = 1.00

CALC. MASS LOADING = 6.3114E+00 GR/ACF 6.3379E+00 GR/DNCF 1.4443E+04 MG/ACM 1.4503E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	3.97	2.21	1.50	0.92	0.46	0.17	
MASS (MILLIGRAMS)	129.54	6.79	5.33	2.92	1.76	0.50	0.39
MG/DNCM/STAGE	1.28E+04	6.69E+02	5.25E+02	2.88E+02	1.73E+02	4.93E+01	3.84E+01
CUM. PERCENT OF MASS SMALLER THAN D50	12.02	7.40	3.78	1.80	0.60	0.26	
CUM. (MG/ACM) SMALLER THAN D50	1.74E+03	1.07E+03	5.46E+02	2.60E+02	8.73E+01	3.83E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.74E+03	1.07E+03	5.49E+02	2.61E+02	8.77E+01	3.84E+01	
CUM. (GR/ACF) SMALLER THAN D50	7.58E-01	4.67E-01	2.39E-01	1.14E-01	3.82E-02	1.67E-02	
CUM. (GR/DNCF) SMALLER THAN D50	7.62E-01	4.69E-01	2.40E-01	1.14E-01	3.83E-02	1.68E-02	
GEO. MEAN DIA. (MICROMETERS)	1.26E+01	2.96E+00	1.82E+00	1.17E+00	6.52E-01	2.82E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.27E+04	2.63E+03	3.12E+03	1.39E+03	5.83E+02	1.19E+02	1.26E+02
DN/DLOGD (NO. PARTICLES/DNCM)	4.63E+09	7.37E+10	3.76E+11	6.06E+11	1.53E+12	3.71E+12	5.16E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.48	3.63	2.48	1.53	0.79	0.32	
GEO. MEAN DIA. (MICROMETERS)	2.05E+01	4.85E+00	3.00E+00	1.95E+00	1.10E+00	5.06E-01	2.28E-01
DM/DLOGD (MG/DNCM)	1.28E+04	2.66E+03	3.17E+03	1.38E+03	6.07E+02	1.26E+02	1.38E+02
DN/DLOGD (NO. PARTICLES/DNCM)	2.84E+09	4.86E+10	2.25E+11	3.56E+11	8.65E+11	1.86E+12	2.06E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APII-3 BRINK 1080 6/14/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 65.0 F = 18.3 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 65.0 F = 18.3 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 8.1136E+00 GR/ACF 8.2882E+00 GR/DNCF 1.8567E+04 MG/ACM 1.8966E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.02	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	167.93	8.44	6.41	3.33	2.03	0.61	0.52
MG/DNCM/STAGE	1.68E+04	8.46E+02	6.42E+02	3.34E+02	2.03E+02	6.11E+01	5.21E+01
CUM. PERCENT OF MASS SMALLER THAN D50	11.27	6.82	3.43	1.67	0.60	0.27	
CUM. (MG/ACM) SMALLER THAN D50	2.09E+03	1.27E+03	6.37E+02	3.10E+02	1.11E+02	5.10E+01	
CUM. (MG/DNCM) SMALLER THAN D50	2.14E+03	1.29E+03	6.50E+02	3.17E+02	1.13E+02	5.21E+01	
CUM. (GR/ACF) SMALLER THAN D50	9.15E-01	5.53E-01	2.78E-01	1.35E-01	4.84E-02	2.23E-02	
CUM. (GR/DNCF) SMALLER THAN D50	9.34E-01	5.65E-01	2.84E-01	1.38E-01	4.95E-02	2.28E-02	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.00E+00	1.84E+00	1.19E+00	6.58E-01	2.84E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.69E+04	3.32E+03	3.82E+03	1.56E+03	6.82E+02	1.42E+02	1.73E+02
DN/DLOGD (NO. PARTICLES/DNCM)	6.03E+09	9.00E+10	4.45E+11	6.80E+11	1.75E+12	4.50E+12	6.88E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.55	3.67	2.51	1.55	0.80	0.32	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.90E+00	3.03E+00	1.97E+00	1.11E+00	5.10E-01	2.29E-01
DM/DLOGD (MG/DNCM)	1.69E+04	3.36E+03	3.88E+03	1.60E+03	7.12E+02	1.56E+02	1.73E+02
DN/DLOGD (NO. PARTICLES/DNCM)	3.70E+09	5.44E+10	2.66E+11	3.99E+11	9.83E+11	2.24E+12	2.70E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API#4 BRINK 1040 6/14/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 65.0 F = 18.3 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 65.0 F = 18.3 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 7.4414E+00 GR/ACF 7.6015E+00 GR/DNCF 1.7028E+04 MG/ACM 1.7395E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.02	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	153.20	8.56	5.93	3.12	1.76	0.59	0.83
MG/DNCM/STAGE	1.54E+04	8.58E+02	5.94E+02	3.13E+02	1.76E+02	5.91E+01	4.31E+01
CUM. PERCENT OF MASS SMALLER THAN D50	11.75	6.81	3.40	1.60	0.59	0.25	
CUM. (MG/ACM) SMALLER THAN D50	2.00E+03	1.16E+03	5.79E+02	2.73E+02	1.00E+02	4.22E+01	
CUM. (MG/DNCM) SMALLER THAN D50	2.04E+03	1.19E+03	5.91E+02	2.79E+02	1.02E+02	4.31E+01	
CUM. (GR/ACF) SMALLER THAN D50	8.74E-01	5.07E-01	2.53E-01	1.19E-01	4.37E-02	1.84E-02	
CUM. (GR/DNCF) SMALLER THAN D50	8.93E-01	5.18E-01	2.58E-01	1.22E-01	4.47E-02	1.88E-02	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.00E+00	1.84E+00	1.19E+00	6.58E-01	2.84E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.54E+04	3.37E+03	3.53E+03	1.46E+03	5.92E+02	1.37E+02	1.43E+02
DN/DLOGD (NO. PARTICLES/DNCM)	5.51E+09	9.13E+10	4.12E+11	6.38E+11	1.51E+12	4.35E+12	5.69E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.55	3.67	2.51	1.55	0.80	0.32	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.90E+00	3.03E+00	1.97E+00	1.11E+00	5.10E-01	2.29E-01
DM/DLOGD (MG/DNCM)	1.54E+04	3.41E+03	3.59E+03	1.50E+03	6.17E+02	1.51E+02	1.43E+02
DN/DLOGD (NO. PARTICLES/DNCM)	3.37E+09	5.52E+10	2.46E+11	3.74E+11	8.52E+11	2.17E+12	2.26E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API-5 BRINK 1040 6/14/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 60.0 F = 15.6 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 60.0 F = 15.6 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.20 O2 = 19.80 H2O = 1.00

CALC. MASS LOADING = 7.4496E+00 GR/ACF 7.5754E+00 GR/DNCF 1.7047E+04 MG/ACM 1.7335E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.00	2.23	1.51	0.92	0.47	0.17	
MASS (MILLIGRAMS)	152.37	8.84	6.48	3.19	1.84	0.62	0.44
MG/DNCM/STAGE	1.52E+04	8.82E+02	6.46E+02	3.18E+02	1.84E+02	6.18E+01	4.39E+01
CUM. PERCENT OF MASS SMALLER THAN D50	12.32	7.23	3.50	1.67	0.61	0.25	
CUM. (MG/ACM) SMALLER THAN D50	2.10E+03	1.23E+03	5.97E+02	2.84E+02	1.04E+02	4.32E+01	
CUM. (MG/DNCM) SMALLER THAN D50	2.14E+03	1.25E+03	6.07E+02	2.89E+02	1.06E+02	4.39E+01	
CUM. (GR/ACF) SMALLER THAN D50	9.18E-01	5.39E-01	2.61E-01	1.24E-01	4.54E-02	1.89E-02	
CUM. (GR/DNCF) SMALLER THAN D50	9.33E-01	5.48E-01	2.65E-01	1.26E-01	4.62E-02	1.92E-02	
GEO. MEAN DIA. (MICROMETERS)	1.26E+01	2.98E+00	1.83E+00	1.18E+00	6.56E-01	2.84E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.52E+04	3.47E+03	3.84E+03	1.49E+03	6.16E+02	1.44E+02	1.46E+02
DN/DLOGD (NO. PARTICLES/DNCM)	5.48E+09	9.52E+10	4.54E+11	6.57E+11	1.59E+12	4.59E+12	9.82E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.52	3.65	2.49	1.54	0.80	0.32	
GEO. MEAN DIA. (MICROMETERS)	2.05E+01	4.88E+00	3.02E+00	1.96E+00	1.11E+00	5.08E-01	2.29E-01
DM/DLOGD (MG/DNCM)	1.52E+04	3.50E+03	3.90E+03	1.52E+03	6.42E+02	1.58E+02	1.46E+02
DN/DLOGD (NO. PARTICLES/DNCM)	3.36E+09	5.76E+10	2.71E+11	3.86E+11	8.98E+11	2.29E+12	2.32E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APII-6 BRINK 1040 6/15/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 4.8321E+00 GR/ACF 4.9706E+00 GR/DNCF 1.1057E+04 MG/ACM 1.1374E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	101.76	4.33	3.27	1.83	1.05	0.29	0.19
MG/DNCM/STAGE	1.03E+04	4.37E+02	3.30E+02	1.85E+02	1.06E+02	2.93E+01	1.92E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.72	5.86	2.98	1.36	0.43	0.17	
CUM. (MG/ACM) SMALLER THAN D50	1.08E+03	6.50E+02	3.30E+02	1.50E+02	4.71E+01	1.86E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.11E+03	6.69E+02	3.39E+02	1.54E+02	4.84E+01	1.92E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.70E-01	2.84E-01	1.44E-01	6.56E-02	2.06E-02	8.14E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.83E-01	2.92E-01	1.48E-01	6.75E-02	2.12E-02	8.38E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.03E+04	1.72E+03	1.96E+03	8.63E+02	3.55E+02	6.78E+01	6.37E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.67E+09	4.60E+10	2.26E+11	3.72E+11	9.00E+11	2.14E+12	2.53E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	1.03E+04	1.73E+03	1.99E+03	8.83E+02	3.70E+02	7.44E+01	6.37E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.25E+09	2.78E+10	1.35E+11	2.18E+11	5.06E+11	1.06E+12	1.00E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API-7 BRINK 1980 6/15/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 4.5547E+00 GR/ACF 4.6853E+00 GR/DNCF 1.0423E+04 MG/ACM 1.0722E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	95.67	3.81	3.33	1.78	1.17	0.30	0.19
MG/DNCM/STAGE	9.65E+03	3.84E+02	3.36E+02	1.80E+02	1.18E+02	3.03E+01	1.92E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.96	6.37	3.24	1.56	0.46	0.18	
CUM. (MG/ACM) SMALLER THAN D50	1.04E+03	6.64E+02	3.37E+02	1.63E+02	4.81E+01	1.86E+01	
CUM. (MG/DNCM) SMALLER THAN D50	1.07E+03	6.83E+02	3.47E+02	1.68E+02	4.94E+01	1.92E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.54E-01	2.90E-01	1.47E-01	7.12E-02	2.10E-02	8.14E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.67E-01	2.99E-01	1.52E-01	7.32E-02	2.16E-02	8.38E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	9.69E+03	1.51E+03	2.00E+03	8.39E+02	3.96E+02	7.01E+01	6.37E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.45E+09	4.05E+10	2.30E+11	3.62E+11	1.00E+12	2.21E+12	2.53E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	9.72E+03	1.53E+03	2.03E+03	8.59E+02	4.13E+02	7.70E+01	6.37E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.11E+09	2.45E+10	1.38E+11	2.12E+11	5.64E+11	1.10E+12	1.00E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APII-8 BRINK 1040 6/15/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 4.1505E+00 GR/ACF 4.2695E+00 GR/DNCF 9.4977E+03 MG/ACM 9.7700E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	87.36	3.71	3.10	1.03	1.10	0.32	0.28
MG/DNCM/STAGE	8.62E+03	3.74E+02	3.13E+02	1.04E+02	1.11E+02	3.23E+01	2.82E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.77	5.94	2.74	1.67	0.54	0.21	
CUM. (MG/ACM) SMALLER THAN D50	9.28E+02	5.64E+02	2.60E+02	1.59E+02	5.10E+01	1.96E+01	
CUM. (MG/DNCM) SMALLER THAN D50	9.55E+02	5.80E+02	2.67E+02	1.63E+02	5.25E+01	2.02E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.06E-01	2.46E-01	1.14E-01	6.94E-02	2.23E-02	8.57E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.17E-01	2.54E-01	1.17E-01	7.14E-02	2.29E-02	8.82E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	8.85E+03	1.47E+03	1.86E+03	4.86E+02	3.72E+02	7.48E+01	6.70E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.15E+09	3.94E+10	2.14E+11	2.10E+11	9.43E+11	2.36E+12	2.66E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	6.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	8.88E+03	1.49E+03	1.89E+03	4.97E+02	3.88E+02	8.21E+01	6.70E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.93E+09	2.38E+10	1.28E+11	1.23E+11	5.31E+11	1.17E+12	1.05E+13

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APTI-9 BRINK 1040 6/16/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = G

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.214 IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 3.8770E+00 GR/ACF 3.9881E+00 GR/DNCF 8.8718E+03 MG/ACM 9.1262E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	81.75	3.39	2.71	1.43	0.83	0.20	0.13
MG/DNCM/STAGE	8.25E+03	3.42E+02	2.73E+02	1.44E+02	8.38E+01	2.02E+01	1.31E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.61	5.86	2.86	1.28	0.36	0.14	
CUM. (MG/ACM) SMALLER THAN D50	8.52E+02	5.20E+02	2.54E+02	1.14E+02	3.24E+01	1.28E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.77E+02	5.35E+02	2.61E+02	1.17E+02	3.33E+01	1.31E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.73E-01	2.27E-01	1.11E-01	4.97E-02	1.41E-02	5.57E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.83E-01	2.34E-01	1.14E-01	5.12E-02	1.46E-02	5.73E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	8.28E+03	1.34E+03	1.63E+03	6.74E+02	2.81E+02	4.67E+01	4.36E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.95E+09	3.60E+10	1.87E+11	2.91E+11	7.11E+11	1.48E+12	1.73E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	8.31E+03	1.36E+03	1.65E+03	6.90E+02	2.93E+02	5.13E+01	4.36E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.81E+09	2.18E+10	1.12E+11	1.71E+11	4.00E+11	7.33E+11	6.84E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API-10 BRINK 1080 6/16/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 3.9550E+00 GR/ACF 4.0684E+00 GR/DNCF 9.0503E+03 MG/ACM 9.3098E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	83.82	3.33	2.54	1.37	0.85	0.22	0.13
MG/DNCM/STAGE	8.46E+03	3.36E+02	2.56E+02	1.38E+02	8.58E+01	2.22E+01	1.31E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.15	5.54	2.79	1.30	0.38	0.14	
CUM. (MG/ACM) SMALLER THAN D50	8.28E+02	5.01E+02	2.52E+02	1.18E+02	3.43E+01	1.28E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.52E+02	5.16E+02	2.59E+02	1.21E+02	3.53E+01	1.31E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.62E-01	2.19E-01	1.10E-01	5.14E-02	1.50E-02	5.57E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.72E-01	2.25E-01	1.13E-01	5.29E-02	1.54E-02	5.73E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.89E-01	1.22E-01
DM/DLOGD (MG/DNCM)	8.49E+03	1.32E+03	1.32E+03	6.46E+02	2.87E+02	5.14E+01	4.36E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.02E+09	3.54E+10	1.76E+11	2.79E+11	7.29E+11	1.62E+12	1.73E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	8.52E+03	1.33E+03	1.35E+03	6.61E+02	3.00E+02	5.65E+01	4.36E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.85E+09	2.14E+10	1.05E+11	1.63E+11	4.10E+11	8.06E+11	6.84E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API-11 BRINK 1040 6/16/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 0

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 3.4980E+00 GR/ACF 3.5983E+00 GR/DNCF 8.0046E+03 MG/ACM 8.2341E+03 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	73.01	3.28	2.67	1.37	0.90	0.22	0.15
MG/DNCM/STAGE	7.37E+03	3.31E+02	2.69E+02	1.38E+02	9.08E+01	2.22E+01	1.51E+01
CUM. PERCENT OF MASS SMALLER THAN D50	10.53	6.51	3.24	1.56	0.45	0.18	
CUM. (MG/ACM) SMALLER THAN D50	8.43E+02	5.21E+02	2.59E+02	1.25E+02	3.63E+01	1.47E+01	
CUM. (MG/DNCM) SMALLER THAN D50	8.67E+02	5.36E+02	2.66E+02	1.28E+02	3.73E+01	1.51E+01	
CUM. (GR/ACF) SMALLER THAN D50	3.68E-01	2.28E-01	1.13E-01	5.44E-02	1.59E-02	6.43E-03	
CUM. (GR/DNCF) SMALLER THAN D50	3.79E-01	2.34E-01	1.16E-01	5.60E-02	1.63E-02	6.61E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	7.39E+03	1.30E+03	1.60E+03	6.46E+02	3.04E+02	5.14E+01	5.03E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.63E+09	3.48E+10	1.85E+11	2.79E+11	7.71E+11	1.62E+12	1.99E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	7.42E+03	1.31E+03	1.63E+03	6.61E+02	3.17E+02	5.65E+01	5.03E+01
DN/DLOGD (NO. PARTICLES/DNCM)	1.61E+09	2.11E+10	1.10E+11	1.63E+11	4.34E+11	8.06E+11	7.90E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APII-12 BRINK 1040 6/17/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 4.6018E+00 GR/ACF 4.7334E+00 GR/DNCF 1.0530E+04 MG/ACM 1.0832E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	96.79	4.53	3.36	1.54	0.86	0.16	0.10
MG/DNCM/STAGE	9.77E+03	4.57E+02	3.39E+02	1.55E+02	8.68E+01	1.61E+01	1.01E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.83	5.61	2.48	1.04	0.24	0.09	
CUM. (MG/ACM) SMALLER THAN D50	1.03E+03	5.91E+02	2.61E+02	1.10E+02	2.55E+01	9.81E+00	
CUM. (MG/DNCM) SMALLER THAN D50	1.06E+03	6.07E+02	2.68E+02	1.13E+02	2.62E+01	1.01E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.52E-01	2.58E-01	1.14E-01	4.80E-02	1.11E-02	4.29E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.65E-01	2.65E-01	1.17E-01	4.94E-02	1.15E-02	4.41E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	9.80E+03	1.80E+03	2.02E+03	7.26E+02	2.91E+02	3.74E+01	3.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.49E+09	4.81E+10	2.32E+11	3.13E+11	7.37E+11	1.18E+12	1.33E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	9.83E+03	1.81E+03	2.05E+03	7.43E+02	3.03E+02	4.11E+01	3.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.14E+09	2.91E+10	1.39E+11	1.84E+11	4.15E+11	5.86E+11	5.26E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

API-13 BRINK 1040 6/17/78 INLET SAMPLE MODIFIED BRINK CASCADE IMPACTOR NUMBER = 6

IMPACTOR FLOWRATE = 0.060 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 6.00 MIN

IMPACTOR PRESSURE DROP = 0.2IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 29.17 IN. OF HG MAX. PARTICLE DIAMETER = 40.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 4.9409E+00 GR/ACF 5.0826E+00 GR/DNCF 1.1307E+04 MG/ACM 1.1631E+04 MG/DNCM

IMPACTOR STAGE	S0	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6	7
D50 (MICROMETERS)	4.03	2.24	1.52	0.93	0.47	0.17	
MASS (MILLIGRAMS)	104.80	4.58	3.26	1.49	0.86	0.17	0.10
MG/DNCM/STAGE	1.06E+04	4.62E+02	3.29E+02	1.50E+02	8.68E+01	1.72E+01	1.01E+01
CUM. PERCENT OF MASS SMALLER THAN D50	9.08	5.10	2.27	0.98	0.23	0.09	
CUM. (MG/ACM) SMALLER THAN D50	1.03E+03	5.77E+02	2.57E+02	1.11E+02	2.65E+01	9.81E+00	
CUM. (MG/DNCM) SMALLER THAN D50	1.06E+03	5.93E+02	2.64E+02	1.14E+02	2.72E+01	1.01E+01	
CUM. (GR/ACF) SMALLER THAN D50	4.48E-01	2.52E-01	1.12E-01	4.84E-02	1.16E-02	4.29E-03	
CUM. (GR/DNCF) SMALLER THAN D50	4.61E-01	2.59E-01	1.16E-01	4.98E-02	1.19E-02	4.41E-03	
GEO. MEAN DIA. (MICROMETERS)	1.27E+01	3.01E+00	1.85E+00	1.19E+00	6.60E-01	2.85E-01	1.22E-01
DM/DLOGD (MG/DNCM)	1.06E+04	1.62E+03	1.96E+03	7.02E+02	2.91E+02	3.97E+01	3.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	3.78E+09	4.86E+10	2.25E+11	3.03E+11	7.37E+11	1.25E+12	1.33E+13

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.58	3.68	2.51	1.55	0.80	0.33	
GEO. MEAN DIA. (MICROMETERS)	2.06E+01	4.92E+00	3.04E+00	1.98E+00	1.12E+00	5.11E-01	2.30E-01
DM/DLOGD (MG/DNCM)	1.06E+04	1.83E+03	1.99E+03	7.19E+02	3.03E+02	4.36E+01	3.35E+01
DN/DLOGD (NO. PARTICLES/DNCM)	2.31E+09	2.94E+10	1.35E+11	1.78E+11	4.15E+11	6.23E+11	5.26E+12

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.322	0.322	0.370	0.340	0.345	0.314	0.314
HOLE DIAMETERS BY STAGE (CENTIMETERS)	0.3616	0.2472	0.1759	0.1367	0.0898	0.0567	0.0567

APID=1 U. OF W. A 6/12-14/78

IMPACTOR FLOWRATE = 1.630 ACFM IMPACTOR TEMPERATURE = 85.0 F = 29.4 C SAMPLING DURATION = 2880 MIN

IMPACTOR PRESSURE DROP = 4.9IN. OF HG STACK TEMPERATURE = 85.0 F = 29.4 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.72 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.20 O2 = 19.80 H2O = 1.00

CALC. MASS LOADING = 7.4920E-05 GR/ACF 8.1103E-05 GR/DNCF 1.7144E-01 MG/ACM 1.8559E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	3.94	3.94	1.74	0.59	0.30	
MASS (MILLIGRAMS)	15.31	3.13	1.53	0.86	0.59	1.37
MG/DNCM/STAGE	1.25E-01	2.55E-02	1.25E-02	7.00E-03	4.80E-03	1.12E-02
CUM. PERCENT OF MASS SMALLER THAN D50	32.62	19.09	12.37	6.60	6.01	
CUM. (MG/ACM) SMALLER THAN D50	5.63E-02	3.27E-02	2.12E-02	1.47E-02	1.03E-02	
CUM. (MG/DNCM) SMALLER THAN D50	6.09E-02	3.54E-02	2.30E-02	1.60E-02	1.12E-02	
CUM. (GR/ACF) SMALLER THAN D50	2.46E-05	1.43E-05	9.27E-06	6.44E-06	4.50E-06	
CUM. (GR/DNCF) SMALLER THAN D50	2.66E-05	1.55E-05	1.00E-05	6.98E-06	4.88E-06	
GEO. MEAN DIA. (MICROMETERS)	8.88E+00	3.94E+00	2.62E+00	1.01E+00	4.24E-01	2.16E-01
DM/DLOGD (MG/DNCM)	1.77E-01	3.71E-01	3.52E-02	1.49E-02	1.68E-02	3.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.84E+05	4.41E+06	1.43E+06	1.04E+07	1.60E+08	2.70E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.44	6.43	2.87	1.00	0.55	
GEO. MEAN DIA. (MICROMETERS)	1.44E+01	6.43E+00	4.30E+00	1.70E+00	7.44E-01	3.98E-01
DM/DLOGD (MG/DNCM)	1.78E-01	3.74E+01	3.56E-02	1.53E-02	1.69E-02	3.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.13E+05	2.68E+06	8.58E+05	5.99E+06	8.58E+07	1.19E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.368
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524

APID=3 U. OF W. D 6/13-18/78

IMPACTOR FLOWRATE = 1.510 ACFM IMPACTOR TEMPERATURE = 50.0 F = 10.0 C SAMPLING DURATION = 1867 MIN

IMPACTOR PRESSURE DROP = 6.6IN. OF HG STACK TEMPERATURE = 50.0 F = 10.0 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.72 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.20 O2 = 19.80 H2O = 1.00

CALC. MASS LOADING = 1.1299E-04 GR/ACF 1.1445E-04 GR/DNCF 2.5855E-01 MG/ACM 2.6189E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	4.01	3.98	1.79	0.70	0.28	
MASS (MILLIGRAMS)	13.83	2.88	1.66	0.72	0.58	0.97
MG/DNCM/STAGE	1.75E-01	3.65E-02	2.11E-02	9.14E-03	7.36E-03	1.23E-02
CUM. PERCENT OF MASS SMALLER THAN D50	32.99	19.04	11.00	7.51	4.70	
CUM. (MG/ACM) SMALLER THAN D50	8.53E-02	4.92E-02	2.84E-02	1.94E-02	1.22E-02	
CUM. (MG/DNCM) SMALLER THAN D50	8.64E-02	4.99E-02	2.88E-02	1.97E-02	1.23E-02	
CUM. (GR/ACF) SMALLER THAN D50	3.73E-05	2.15E-05	1.24E-05	8.48E-06	5.31E-06	
CUM. (GR/DNCF) SMALLER THAN D50	3.78E-05	2.18E-05	1.26E-05	8.59E-06	5.38E-06	
GEO. MEAN DIA. (MICROMETERS)	8.96E+00	3.99E+00	2.67E+00	1.12E+00	4.44E-01	1.98E-01
DM/DLOGD (MG/DNCM)	2.51E-01	1.02E+01	6.06E-02	2.26E-02	1.84E-02	4.09E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.55E+05	1.17E+06	2.33E+06	1.17E+07	1.53E+08	3.84E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.54	6.49	2.94	1.18	0.51	
GEO. MEAN DIA. (MICROMETERS)	1.45E+01	6.51E+00	4.37E+00	1.87E+00	7.77E-01	3.61E-01
DM/DLOGD (MG/DNCM)	2.53E-01	1.03E+01	6.13E-02	2.31E-02	2.01E-02	4.09E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.57E+05	7.13E+07	1.41E+06	6.79E+06	8.18E+07	1.66E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495

APID=4 U. OF M. A 6/14-15/78

IMPACTOR FLOWRATE = 1.630 ACFM IMPACTOR TEMPERATURE = 60.0 F = 15.6 C SAMPLING DURATION = 1270 MIN

IMPACTOR PRESSURE DROP = 4.5IN. OF HG STACK TEMPERATURE = 60.0 F = 15.6 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.29 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 2.4564E-04 GR/ACF 2.5626E-04 GR/DNCF 5.6211E-01 MG/ACM 5.8642E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	3.89	3.38	1.72	0.88	0.31	
MASS (MILLIGRAMS)	23.00	4.92	2.79	1.30	0.86	0.38
MG/DNCM/STAGE	4.09E-01	8.76E-02	4.97E-02	2.31E-02	9.97E-03	6.76E-03
CUM. PERCENT OF MASS SMALLER THAN D50	30.20	15.27	6.80	2.85	1.15	
CUM. (MG/ACM) SMALLER THAN D50	1.70E-01	8.58E-02	3.82E-02	1.60E-02	6.48E-03	
CUM. (MG/DNCM) SMALLER THAN D50	1.77E-01	8.95E-02	3.99E-02	1.67E-02	6.76E-03	
CUM. (GR/ACF) SMALLER THAN D50	7.42E-05	3.75E-05	1.67E-05	7.01E-06	2.83E-06	
CUM. (GR/DNCF) SMALLER THAN D50	7.74E-05	3.91E-05	1.74E-05	7.31E-06	2.96E-06	
GEO. MEAN DIA. (MICROMETERS)	8.82E+00	3.88E+00	2.58E+00	1.00E+00	4.83E-01	2.17E-01
DM/DLOGD (MG/DNCM)	5.75E-01	1.27E+02	1.40E-01	4.93E-02	3.57E-02	2.25E-02
DN/DLOGD (NO. PARTICLES/DNCM)	6.12E+05	1.59E+09	5.95E+06	3.59E+07	3.45E+08	1.61E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.34	6.33	2.83	0.99	0.55	
GEO. MEAN DIA. (MICROMETERS)	1.43E+01	6.34E+00	4.23E+00	1.67E+00	7.39E-01	3.90E-01
DM/DLOGD (MG/DNCM)	5.78E-01	1.29E+02	1.42E-01	5.07E-02	3.92E-02	2.25E-02
DN/DLOGD (NO. PARTICLES/DNCM)	3.75E+05	9.65E+08	3.58E+06	2.07E+07	1.86E+08	7.25E+08

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524

APIC-5 U. OF W. D 6/14-15/78

IMPACTOR FLOWRATE = 0.760 ACFM IMPACTOR TEMPERATURE = 60.0 F = 15.6 C SAMPLING DURATION = 1270 MIN

IMPACTOR PRESSURE DROP = 6.2IN. OF HG STACK TEMPERATURE = 60.0 F = 15.6 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.29 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 6.6210E-04 GR/ACF 6.9073E-04 GR/DNCF 1.5151E+00 MG/ACM 1.5806E+00 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	5.73	5.68	2.57	1.03	0.44	
MASS (MILLIGRAMS)	32.76	3.71	2.97	1.09	0.43	0.45
MG/DNCM/STAGE	1.25E+00	1.42E-01	1.13E-01	4.16E-02	1.64E-02	1.72E-02
CUM. PERCENT OF MASS SMALLER THAN D50	20.89	11.93	4.76	2.13	1.09	
CUM. (MG/ACM) SMALLER THAN D50	3.16E-01	1.81E-01	7.21E-02	3.22E-02	1.65E-02	
CUM. (MG/DNCM) SMALLER THAN D50	3.30E-01	1.89E-01	7.52E-02	3.36E-02	1.72E-02	
CUM. (GR/ACF) SMALLER THAN D50	1.38E-04	7.90E-05	3.15E-05	1.41E-05	7.19E-06	
CUM. (GR/DNCF) SMALLER THAN D50	1.44E-04	8.24E-05	3.29E-05	1.47E-05	7.51E-06	
GEO. MEAN DIA. (MICROMETERS)	1.07E+01	5.71E+00	3.82E+00	1.63E+00	6.71E-01	3.10E-01
DM/DLOGD (MG/DNCM)	2.30E+00	3.99E+01	3.29E-01	1.05E-01	4.43E-02	5.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.37E+06	1.56E+08	4.30E+06	1.78E+07	1.07E+08	1.40E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	9.32	9.25	4.21	1.71	0.77	
GEO. MEAN DIA. (MICROMETERS)	1.74E+01	9.29E+00	6.24E+00	2.68E+00	1.15E+00	5.44E-01
DM/DLOGD (MG/DNCM)	2.31E+00	4.01E+01	3.32E-01	1.06E-01	4.72E-02	5.71E-02
DN/DLOGD (NO. PARTICLES/DNCM)	8.42E+05	9.56E+07	2.61E+06	1.05E+07	5.98E+07	6.78E+08

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PST BY STAGE	0.144	0.330	0.371	0.319	0.321
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495

APIO-6 U. OF W. D 6/15-16/76

IMPACTOR FLOWRATE = 1.510 ACFM IMPACTOR TEMPERATURE = 65.0 F = 18.3 C SAMPLING DURATION = 1343 MIN

IMPACTOR PRESSURE DROP = 6.3IN. OF HG STACK TEMPERATURE = 65.0 F = 18.3 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.44 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 3.1771E-04 GR/ACF 3.3288E-04 GR/DNCF 7.2704E-01 MG/ACM 7.6174E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	4.05	4.02	1.81	0.71	0.28	
MASS (MILLIGRAMS)	33.37	3.82	2.79	1.03	0.43	0.31
MG/DNCM/STAGE	6.09E-01	6.97E-02	5.09E-02	1.88E-02	7.85E-03	5.66E-03
CUM. PERCENT OF MASS SMALLER THAN D50	20.07	10.92	4.28	1.77	0.74	
CUM. (MG/ACM) SMALLER THAN D50	1.46E-01	7.94E-02	3.08E-02	1.29E-02	5.40E-03	
CUM. (MG/DNCM) SMALLER THAN D50	1.53E-01	8.32E-02	3.23E-02	1.35E-02	5.66E-03	
CUM. (GR/ACF) SMALLER THAN D50	6.38E-05	3.47E-05	1.35E-05	5.63E-06	2.36E-06	
CUM. (GR/DNCF) SMALLER THAN D50	6.68E-05	3.64E-05	1.41E-05	5.90E-06	2.47E-06	
GEO. MEAN DIA. (MICROMETERS)	9.00E+00	4.04E+00	2.69E+00	1.13E+00	4.48E-01	2.00E-01
DM/DLOGD (MG/DNCM)	8.78E-01	1.95E+01	1.46E-01	4.63E-02	1.96E-02	1.88E-02
DN/DLOGD (NO. PARTICLES/DNCM)	8.77E+05	2.16E+08	5.45E+06	2.33E+07	1.60E+08	1.71E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.61	6.56	2.97	1.20	0.52	
GEO. MEAN DIA. (MICROMETERS)	1.46E+01	6.59E+00	4.42E+00	1.89E+00	7.86E-01	3.66E-01
DM/DLOGD (MG/DNCM)	8.83E-01	1.97E+01	1.48E-01	4.75E-02	2.16E-02	1.88E-02
DN/DLOGD (NO. PARTICLES/DNCM)	5.38E+05	1.31E+08	3.29E+06	1.35E+07	8.47E+07	7.35E+08

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495

APIO-7 U. OF W. A 6/15-16/78

IMPACTOR FLOWRATE = 1.630 ACFM IMPACTOR TEMPERATURE = 65.0 F = 18.3 C SAMPLING DURATION = 1343 MIN

IMPACTOR PRESSURE DROP = 4.6IN. OF HG STACK TEMPERATURE = 65.0 F = 18.3 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.44 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.60 O2 = 19.90 H2O = 0.50

CALC. MASS LOADING = 3.0638E-04 GR/ACF 3.2100E-04 GR/DNCF 7.0110E-01 MG/ACM 7.3457E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	3.90	3.89	1.72	0.58	0.31	
MASS (MILLIGRAMS)	33.26	4.99	3.02	1.34	0.46	0.39
MG/DNCM/STAGE	5.62E-01	8.43E-02	5.10E-02	2.26E-02	7.77E-03	6.59E-03
CUM. PERCENT OF MASS SMALLER THAN D50	23.47	11.99	5.04	1.96	0.90	
CUM. (MG/ACM) SMALLER THAN D50	1.65E-01	8.40E-02	3.53E-02	1.37E-02	6.29E-03	
CUM. (MG/DNCM) SMALLER THAN D50	1.72E-01	8.81E-02	3.70E-02	1.44E-02	6.59E-03	
CUM. (GR/ACF) SMALLER THAN D50	7.19E-05	3.67E-05	1.54E-05	5.99E-06	2.75E-06	
CUM. (GR/DNCF) SMALLER THAN D50	7.53E-05	3.85E-05	1.62E-05	6.28E-06	2.88E-06	
GEO. MEAN DIA. (MICROMETERS)	8.83E+00	3.90E+00	2.59E+00	1.00E+00	4.23E-01	2.16E-01
DM/DLOGD (MG/DNCM)	7.92E-01	1.23E+02	1.44E-01	4.82E-02	2.77E-02	2.19E-02
DN/DLOGD (NO. PARTICLES/DNCM)	8.38E+05	1.51E+09	6.05E+06	3.48E+07	2.67E+08	1.58E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.36	6.35	2.84	0.99	0.55	
GEO. MEAN DIA. (MICROMETERS)	1.44E+01	6.36E+00	4.25E+00	1.68E+00	7.40E-01	3.89E-01
DM/DLOGD (MG/DNCM)	7.96E-01	1.24E+02	1.46E-01	4.96E-02	3.04E-02	2.19E-02
DN/DLOGD (NO. PARTICLES/DNCM)	5.14E+05	9.21E+08	3.64E+06	2.00E+07	1.43E+08	7.08E+08

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524	

APIO-8 U. OF W. A 6/16-17/78

IMPACTOR FLOWRATE = 1.630 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 1326 MIN

IMPACTOR PRESSURE DROP = 4.8IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.56 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.86 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 6.4760E-05 GR/ACF 6.8040E-05 GR/DNCF 1.4819E-01 MG/ACM 1.5570E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	3.91	3.91	1.73	0.59	0.31	
MASS (MILLIGRAMS)	6.70	0.87	0.56	0.27	0.17	0.50
MG/DNCM/STAGE	1.15E-01	1.49E-02	9.61E-03	4.63E-03	2.92E-03	8.58E-03
CUM. PERCENT OF MASS SMALLER THAN D50	26.13	16.54	10.36	7.39	5.51	
CUM. (MG/ACM) SMALLER THAN D50	3.87E-02	2.45E-02	1.54E-02	1.09E-02	8.17E-03	
CUM. (MG/DNCM) SMALLER THAN D50	4.07E-02	2.57E-02	1.61E-02	1.15E-02	8.58E-03	
CUM. (GR/ACF) SMALLER THAN D50	1.69E-05	1.07E-05	6.71E-06	4.78E-06	3.57E-06	
CUM. (GR/DNCF) SMALLER THAN D50	1.78E-05	1.13E-05	7.05E-06	5.03E-06	3.75E-06	
GEO. MEAN DIA. (MICROMETERS)	8.85E+00	3.91E+00	2.60E+00	1.01E+00	4.23E-01	2.16E-01
DM/DLOGD (MG/DNCM)	1.62E-01	2.17E+01	2.72E-02	9.86E-03	1.03E-02	2.85E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.71E+05	2.65E+08	1.13E+06	7.04E+06	9.91E+07	2.06E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.39	6.38	2.85	1.00	0.55	
GEO. MEAN DIA. (MICROMETERS)	1.44E+01	6.38E+00	4.26E+00	1.69E+00	7.41E-01	3.98E-01
DM/DLOGD (MG/DNCM)	1.43E-01	2.19E+01	2.75E-02	1.02E-02	1.13E-02	2.65E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.05E+05	1.61E+08	6.77E+05	4.05E+06	5.32E+07	9.21E+08

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524

APIO-9 U. OF W. D 6/16-17/78

IMPACTOR FLOWRATE = 1.510 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 1326 MIN

IMPACTOR PRESSURE DROP = 6.5IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.56 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 6.2431E-05 GR/ACF 6.5592E-05 GR/DNCF 1.4286E-01 MG/ACM 1.5010E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	4.07	4.04	1.81	0.71	0.28	
MASS (MILLIGRAMS)	5.91	0.78	0.48	0.23	0.27	0.43
MG/DNCM/STAGE	1.10E-01	1.45E-02	8.89E-03	4.26E-03	5.00E-03	7.97E-03
CUM. PERCENT OF MASS SMALLER THAN D50	27.04	17.41	11.48	8.64	5.31	
CUM. (MG/ACM) SMALLER THAN D50	3.86E-02	2.49E-02	1.64E-02	1.23E-02	7.58E-03	
CUM. (MG/DNCM) SMALLER THAN D50	4.06E-02	2.61E-02	1.72E-02	1.30E-02	7.97E-03	
CUM. (GR/ACF) SMALLER THAN D50	1.69E-05	1.09E-05	7.17E-06	5.40E-06	3.31E-06	
CUM. (GR/DNCF) SMALLER THAN D50	1.77E-05	1.14E-05	7.53E-06	5.67E-06	3.48E-06	
GEO. MEAN DIA. (MICROMETERS)	9.02E+00	4.05E+00	2.71E+00	1.14E+00	4.48E-01	2.00E-01
DM/DLOGD (MG/DNCM)	1.58E-01	4.04E+00	2.56E-02	1.05E-02	1.25E-02	2.65E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.57E+05	4.43E+07	9.42E+05	5.22E+06	1.01E+08	2.43E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.64	6.59	2.98	1.20	0.52	
GEO. MEAN DIA. (MICROMETERS)	1.47E+01	6.61E+00	4.43E+00	1.89E+00	7.86E-01	3.66E-01
DM/DLOGD (MG/DNCM)	1.59E-01	4.08E+00	2.59E-02	1.08E-02	1.37E-02	2.65E-02
DN/DLOGD (NO. PARTICLES/DNCM)	9.65E+04	2.69E+07	5.67E+05	3.04E+06	5.35E+07	1.04E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495	

APIO-10 U. OF W. D 6/18-19/78

IMPACTOR FLOWRATE = 1.510 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 1440 MIN

IMPACTOR PRESSURE DROP = 6.5IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.64 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.80 O2 = 19.95 H2O = 0.25

CALC. MASS LOADING = 9.2413E-05 GR/ACF 9.6822E-05 GR/DNCF 2.1147E-01 MG/ACM 2.2156E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	4.07	4.04	1.81	0.71	0.28	
MASS (MILLIGRAMS)	8.91	1.08	0.59	0.32	0.43	0.66
MG/DNCM/STAGE	1.65E-01	2.00E-02	1.09E-02	5.91E-03	7.95E-03	1.22E-02
CUM. PERCENT OF MASS SMALLER THAN D50	25.69	16.68	11.76	9.09	5.50	
CUM. (MG/ACM) SMALLER THAN D50	5.43E-02	3.53E-02	2.49E-02	1.92E-02	1.16E-02	
CUM. (MG/DNCM) SMALLER THAN D50	5.69E-02	3.70E-02	2.61E-02	2.01E-02	1.22E-02	
CUM. (GR/ACF) SMALLER THAN D50	2.37E-05	1.54E-05	1.09E-05	8.40E-06	5.09E-06	
CUM. (GR/DNCF) SMALLER THAN D50	2.49E-05	1.62E-05	1.14E-05	8.80E-06	5.33E-06	
GEO. MEAN DIA. (MICROMETERS)	9.02E+00	4.05E+00	2.71E+00	1.14E+00	4.49E-01	2.00E-01
DM/DLOGD (MG/DNCM)	2.38E-01	5.56E+00	3.14E-02	1.46E-02	1.98E-02	4.05E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.36E+05	6.11E+07	1.15E+06	7.24E+06	1.60E+08	3.70E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.64	6.59	2.98	1.20	0.52	
GEO. MEAN DIA. (MICROMETERS)	1.47E+01	6.61E+00	4.43E+00	1.89E+00	7.88E-01	3.66E-01
DM/DLOGD (MG/DNCM)	2.39E-01	5.63E+00	3.17E-02	1.49E-02	2.18E-02	4.09E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.45E+05	3.72E+07	6.95E+05	4.21E+06	8.49E+07	1.58E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.319	0.321	
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5743	0.2512	0.0793	0.0495	

APIO-11 U. OF W. A 6/18-19/78

IMPACTOR FLOWRATE = 1.630 ACFM IMPACTOR TEMPERATURE = 70.0 F = 21.1 C SAMPLING DURATION = 1440 MIN

IMPACTOR PRESSURE DROP = 4.8IN. OF HG STACK TEMPERATURE = 70.0 F = 21.1 C

ASSUMED PARTICLE DENSITY = 2.62 GM/CU.CM. STACK PRESSURE = 28.64 IN. OF HG MAX. PARTICLE DIAMETER = 20.0 MICROMETERS

GAS COMPOSITION (PERCENT) CO2 = 0.00 CO = 0.00 N2 = 79.84 O2 = 19.96 H2O = 0.20

CALC. MASS LOADING = 9.0750E-05 GR/ACF 9.5032E-05 GR/DNCF 2.0767E-01 MG/ACM 2.1747E-01 MG/DNCM

IMPACTOR STAGE	S1	S2	S3	S4	S5	FILTER
STAGE INDEX NUMBER	1	2	3	4	5	6
D50 (MICROMETERS)	3.92	3.91	1.73	0.59	0.31	
MASS (MILLIGRAMS)	10.01	0.89	0.48	0.31	0.25	0.77
MG/DNCM/STAGE	1.71E-01	1.52E-02	8.21E-03	5.30E-03	4.28E-03	1.32E-02
CUM. PERCENT OF MASS SMALLER THAN D50	21.24	14.24	10.46	8.03	6.06	
CUM. (MG/ACM) SMALLER THAN D50	4.41E-02	2.96E-02	2.17E-02	1.67E-02	1.26E-02	
CUM. (MG/DNCM) SMALLER THAN D50	4.62E-02	3.10E-02	2.28E-02	1.75E-02	1.32E-02	
CUM. (GR/ACF) SMALLER THAN D50	1.93E-05	1.29E-05	9.50E-06	7.28E-06	5.50E-06	
CUM. (GR/DNCF) SMALLER THAN D50	2.02E-05	1.35E-05	9.94E-06	7.63E-06	5.76E-06	
GEO. MEAN DIA. (MICROMETERS)	8.85E+00	3.91E+00	2.60E+00	1.01E+00	4.24E-01	2.16E-01
DM/DLOGD (MG/DNCM)	2.42E-01	2.22E+01	2.32E-02	1.13E-02	1.51E-02	4.38E-02
DN/DLOGD (NO. PARTICLES/DNCM)	2.54E+05	2.70E+08	9.62E+05	8.05E+06	1.45E+08	3.15E+09

AERODYNAMIC DIAMETERS ARE CALCULATED HERE ACCORDING TO THE TASK GROUP ON LUNG DYNAMICS DEFINITION

D50 (MICROMETERS)	6.39	6.38	2.85	1.00	0.55	
GEO. MEAN DIA. (MICROMETERS)	1.44E+01	6.38E+00	4.26E+00	1.69E+00	7.41E-01	3.90E-01
DM/DLOGD (MG/DNCM)	2.43E-01	2.24E+01	2.35E-02	1.16E-02	1.66E-02	4.38E-02
DN/DLOGD (NO. PARTICLES/DNCM)	1.56E+05	1.64E+08	5.78E+05	4.63E+06	7.79E+07	1.41E+09

NORMAL (ENGINEERING STANDARD) CONDITIONS ARE 21 DEG C AND 760MM HG.

SQUARE ROOTS OF PSI BY STAGE	0.144	0.330	0.371	0.271	0.308
HOLE DIAMETERS BY STAGE (CENTIMETERS)	1.8237	0.5768	0.2501	0.0808	0.0524